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CAPE OF GOOD HOPE.

DEPARTMENT OF AGRICULTURE.

REPORT

OF THE

DIRECTOR OF AGRICULTURE

(WITH APPENDICES)

FOR THE YEAR 1906.

Presented to both Houses of Parliament by Command of His Excellency the Governor.
1907.

CAPE TOWN:
CAPE TIMES LIMITED, GOVERNMENT PRINTERS.
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INTRODUCTION.

My Report for the year 1906, which is submitted herewith, has been compiled on similar lines to that of last year.

It may be remarked that to render the work of the Department thoroughly efficient and satisfactory, means will have to be provided to enable its functions to be extended in various directions, which are fully dealt with hereinafter under their respective Subheads.

It only remains for me to say that owing to the non-existence of such means the work of the Department has been severely handicapped in many ways, and it is earnestly hoped that it will be possible to provide for the amelioration of these conditions in the future.

THE ORGANISATION OF AGRICULTURAL ASSOCIATIONS.

The proposal placed by this Department before Associations in favour of amalgamation, and mentioned in my last Report, was briefly:—

(1) That owing to a tendency to devolution, to overlapping of work and dissipation of influence, farmers' associations, agricultural societies, and also, if possible, fruitgrowers' associations, should combine their work;

(2) That the amalgamated bodies should then adopt the comprehensive title of Agricultural Society;

(3) That they should meet annually in Congress as the Agricultural Union of the Colony; and the opinion was expressed that greater weight should attach to the views of a Union so composed, because it would be better able to give utterance to the opinions and needs of the agricultural community.

Discussions by the Vine and Fruitgrowers' Congress, the Farmers' Congress and the existing Agricultural Union followed. The last named was in favour of the scheme, but the other two bodies rejected it. A conference of representatives of the three organisations took place in Cape Town shortly after, however, when it was agreed that the time had arrived for clearly defining the spheres of labour of the Farmers' Congress and the Vine and Fruitgrowers' Congress; that a Committee should be appointed for the purpose, and that the Congress of each of the three bodies should nominate six delegates, who should form an Agricultural Council, meeting after each Congress to present to Government the combined reports of the organisations and, if necessary, consider and decide upon matters "common to all"—by which is apparently meant resolutions which are conflicting. A further meeting was held at which it was resolved that the Vine and Fruitgrowers' Congress should deal exclusively with Horticultural and Viticultural questions; the Farmers' Congress with all other farming interests, and the Agricultural Union with Shows. These decisions, which were by a majority Vote, were subject to ratification by the three organisations, and the Agricultural Union declined to agree to the position assigned to it.

A good deal of the opposition to the original proposal arose, it appears, from the suggestion that the amalgamated associations should be known as Agricultural Societies, which was taken to mean that Farmers' Associations and Fruitgrowers' Associations should lose their individuality and be absorbed by Agricultural Societies, whereas in fact the names Agricultural Society and Agricultural Union were suggested, not with reference to the bodies at present constituted under these names, but because they would be probably the most appropriate. The lines on which amalgamation should be brought about were left open, so that full and mature discussion might take place. I consider it would be a loss to the country if the work built up and the local interest created by any established Agricultural Association were to disappear; and my circular letter which raised the question of amalgamation, so far from desiring or suggesting such a contingency, clearly indicated the strengthening and not the weakening of the influence of existing bodies. What name the amalgamated Association should be known by was quite unimportant. The Department desires to be in touch with the agricultural community; that is the principal aim. When this is achieved farmers, through their organisations, will be able to make their needs known and give weight to their views; so long as different agricultural bodies express conflicting opinions on the same subject they will be destructive of their own interests. There should be one organisation with a single branch in a single division; and I suggest for consideration the following:—

(1) That any question of general importance should, if possible, be submitted by the Executive Committee of the Central Association for consideration by the branches;

(2) That the branches, if they represent various sections of agricultural work, should be divided into corresponding sub-committees, who should deal with all matters pertaining exclusively to their respective sections, and report to the regular meetings of the branch association; the whole of the sub-committees' reports to be embodied, however, in the general report of the branch. If necessary there should be sub-committees dealing respectively with viticulture, stock, fruit, etc., so that any question arising may be deliberated and decided on by those whose interests are affected and who may be presumed to have intimate knowledge on the subject;

(3) That the delegates to Congress should have freedom of action; but the views of their respective branches would have due weight with them in giving their votes.

The object should be to let members feel that they have a voice in the work of the Central Association; that their interest in the agricultural administration of the country is a personal one; every member should have an opportunity, without unnecessary tax on his time, of interesting himself in any local activity for the development of agriculture, whether in a show, or a stock-fair, or a reaping competition, or any other effort to promote local agricultural

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interests; he should not require to belong to an agricultural society to have a voice in the agricultural show at which his stock are shown, and also to a Farmers' Association to have a voice in the quarterly fair at which his stock are sold, because such a state of things, by means of different meetings, at probably different centres with, for the most part, different members, necessitates double activity on his part.

The President of the Vine and Fruitgrowers' Congress, who was one of the delegates at the Conference, has now barought forward a scheme which aims at mutual co-operation on the following lines:—

(1) Each Association of 50 to 99 members should have the right of sending one delegate, and each Association of 100 or more members two delegates to each of the three Congresses;
(2) Each Association can select whether it should be represented at one, two or all the Congresses. It would follow that each Association would send its delegates to the Congress or Congresses in which it is interested;
(3) All the delegates would first meet in a combined Congress to consider whether subjects submitted by Associations to any of the three Congresses should be deliberated on by the combined Congress. Six or more members may veto the discussion of any subject by such combined Congress. If vetoed, the subject must be considered only by the Congress to which it was originally submitted;
(4) When the agenda paper is thus arranged each Congress should proceed to consider the subjects on its own agenda paper;
(5) At the conclusion of the work of the separate Congresses the combined Congress should proceed to consider the subjects allotted to it;
(6) The resolutions passed by the combined Congress would be entrusted to an executive elected by the delegates, the number and duties of such executive to be decided by such Congress.
(7) Whether the executive would develop into a Council of Agriculture, time will show.

This is a welcome advance and would be a distinct improvement, because there would be co-operation among the three Congresses instead of independent action by each as at present; because overlapping of the work of the Congresses would be obviated, and because this improvement, if effected, would give hope of a still further advance in organisation.

There are two important omissions in this scheme; but in pointing out these, I must not be taken to be opposed to acceptance of the instalment. The omissions are (1) that overlapping in the various districts is not provided against, and (2) that the financial requirements of local Associations is not dealt with.

The faults in the present system are generally admitted as regards the work of the Congresses; but they are conspicuous and palpable in the Congresses because they exist in the local Associations. There would be no need to offer remedies to the Congresses if the defects were removed at the sources.

The want of funds is a most potent agency in retarding the work of local Associations; and the need will continue while the present division exists. Parliament has for years past recognised that Agricultural Societies should be liberally assisted. But the work of these bodies is systematised; they labour for a well-defined purpose; the country receives value for what it spends. But by what standard must the work of a Farmers' Association or a Fruitgrowers' Association be appraised? One Association desires Government aid towards the purchase of agricultural literature; another for experimental fruit plots; others for railway carriage on drainage pipes, on manures, or on agricultural machinery and implements; others for postage. It seems clear and only fair that local associations should be charged with definite duties if they are to be entitled to monetary assistance from the Government. There are various duties which such bodies perform with credit and advantage, and many others which they can perform with profit to their district, relieving the Department from the necessity of attending to purely local wants and lessening the Departmental expenditure in a corresponding degree. When Farmers' Associations and Fruitgrowers' Associations are so organised that they would be justified in going to the Government for financial aid. There would then be wholesome decentralisation, provided the Associations looked to the Department for guidance and did not become independent entities; they must in their development follow a policy laid down by the Department. So long as the local Associations remain in want of funds, they will be more or less powerless and purposeless; they will lack the vigour of a healthy body.

INTER-COLONIAL AGRICULTURAL UNION.

The following letter was addressed by me in August to the Agricultural Departments of the Transvaal, Orange River Colony, Natal and Rhodesia:—

> "When attending the last meeting of the Inter-Colonial Agricultural Union, which was held in Cape Town at the end of May last, I was very much disappointed at the meagre report which was given of the proceedings in the local press; and on account of the large majority of the subjects dealt with being more or less of a technical character, the reporters failed to give even an intelligent summary of the proceedings. The consequence was that, although the members present were in a position to obtain a great deal of useful information from the discussion of the subjects dealt with, the meetings were of comparatively little value to the agricultural community generally; hence the latter take comparatively little interest in these Inter-Colonial Union meetings. This is greatly to be regretted, as these meetings should certainly be educative as well as deliberate and advisory in their character, and clearly express the opinions of the more advanced members of the agricultural community. Further, as I have already remarked, the large majority of the subjects which are brought before such a Congress by the representatives of the Pastoral, Agricultural and Horticultural interests must of necessity have more or less of a scientific basis; it is impossible, therefore, for the lay or practical representatives present to discuss these subjects in an intelligent and satisfactory manner unless there is some specialist present who is in a position to explain the nature and chief characteristics of the subject and the direction in which the local or legislative measures are likely to prove beneficial in its suppression, if it is any form of disease of animal or plant life; or how it may be helped forward, if it is some new industry which may be considered capable of profitable development. I am strongly impressed, therefore, with the conviction that if these Inter-Colonial Meetings are to accomplish the object for which they are intended, viz., that of sound advisory bodies to the respective Governments, it is necessary that the specialists of the several Agricultural Departments should attend these meetings in order to guide the lay members in their discussion of all technical subjects. Further, in order to render these meetings educational in their character as far as possible, these specialists should introduce all the technical subjects dealt with by a short paper, in which they would concisely and clearly describe the nature and originating cause—if a disease—and how it may be successfully dealt with; or if it is some new industry, to describe the conditions under which it may be successfully developed. These descriptive papers, which must be as concise as possible, would be handed to the press and published in full, and would prove of great educational value to the general community. I need hardly add that it would be of great advantage to the specialists themselves to be able to confer together at such a meeting, on many professional matters in which they are all deeply interested. If this suggestion should find favour with the respective Governments, the Secretary of the Inter-Colonial Agricultural Union would at once enter into communication with them regarding the subjects to be introduced at the Congress, and the respective specialists who would introduce them, as above indicated.
>
> "I will be glad, therefore, to hear from you whether you favour the suggestion made, or any modification of it, at your earliest convenience."

All the Departments agreed, but the following remarks were made on the proposals by those mentioned:—

Transvaal.—It is thought highly desirable that the Conferences should be as independent as possible, and in no sense overshadowed by the official element, in order that farmers may not lose interest in the Union or attach less importance to the resolutions than they do now.

Rhodesia.—Where any writer of a paper is unable to be present personally, arrangements should be made for the paper to be brought forward by a delegate present, able to deal with the subject.

Orange River Colony.—The meeting of the Central Union of Farmers' Associations of that Colony is considered of much greater importance to the farmers than the meetings held by the Inter-Colonial Union. Assistance in the directions suggested would therefore be given as far as possible without interfering with the work of the Department as it affects the agricultural interests of the Colony.

The next meeting of the Inter-Colonial Union will take place at Pretoria in August.

ANALYTICAL RESEARCH WORK.

Retrenchment in the Analytical Laboratory has squeezed out research work for this Department. It is important that such work should be resumed soon. There is urgent need for an analysis of our fodder plants, more particularly in those areas where stock suffer from dietetic diseases, which are at present believed to be due to the vegetation being deficient in certain constituents which are essential to a complete food. Analysis of the soil in such districts is also required in order to ascertain whether the same constituents are really deficient in the soil or only exist in a form which renders them non-available for plant food. In addition to these special analyses, there is a growing demand by our agriculturists that the Government should undertake, in a systematic manner, the analysis of the different types or classes of our cultivable lands, with the object of giving the farmers information and guidance with regard to manuring and cropping. There is at present also a pressing need for analysis of the different kinds of common salt, which is produced at the respective salt pans throughout the Colony, as many farmers complain that their stock fall off in condition and become unthrifty when supplied with some of these salts for any length of time. I am also anxious to arrange for an analysis of the ash of the salt-bush—locally known as "loog-asch" or "soap ash," which is largely used along with common salt as a lick for stock in certain districts of the Cape and Orange River Colonies.

I mention these things merely to indicate the character of the work to be undertaken. There are many other matters connected with the food and water supply to stock, which we require chemical information upon.

Further, the Superintendent of Agricultural Co-operation has recommended that comparative analyses of foreign and imported meat and wines should be undertaken.

This Department is in the peculiar position of having no Analytical Laboratory attached to it, and consequently no control over the work of that branch of the Service, notwithstanding that the most important work of the Laboratory, if the latter be allowed full activity, must be in connection with agriculture. The work for other Departments is of a routine character and must be done; and, at a time like the present, when agricultural development is receiving more support than hitherto, one of the main research Departments is not in a position to render assistance.

I would urge with all earnestness that the staff of the Analytical Laboratory be strengthened so as to enable it to deal with agricultural work which requires chemical investigation.

COMBINED RESEARCH LABORATORY FOR SOUTH AFRICA.

At the Annual Congress of Fruit and Vine Growers held at Cape Town on the 23rd and 24th May, 1906, the following resolution was passed:—

> "That the Government be requested to approach the other Governments of South Africa with a view of establishing a combined research laboratory to investigate fungoid and other diseases of plant life."

This subject was discussed at the Cape Colony Agricultural Union and Inter-Colonial Agricultural Union Congresses as well, and there was a general agreement expressed regarding the desirability of establishing such a Research Laboratory. The scope of its investigations was, however, recommended to be much wider than is indicated in the resolution forwarded by the Horticultural Congress. It is intended to embrace the diseases of animals as well as those of plants. There are a number of diseases of plants and animals, common, more or less, to the whole of South Africa, the majority of which are of great economic importance to the agricultural and pastoral community. It is not, therefore, merely as a matter of scientific interest that these diseases should be investigated. It has become of vital importance to the general farming industry in many parts of South Africa that some practical solution of the originating causes of these diseases, and how to prevent or modify them, should be discovered. It is readily acknowledged that a great amount of good work has already been accomplished by the professional staffs of the several British South African Colonies, working more or less independently of each other. But the time has arrived when the need for specialists in every branch of science which is applied to Agriculture, Horticulture, Viticulture, Tobacco Culture, and the Pastoral Industry is urgently felt. It is daily becoming more apparent that special knowledge and experience are required to successfully investigate the many problems awaiting solution in connection with Economic Botany, Mycology, Entomology, Bacteriology, Agricultural Chemistry, Scientific Agriculture, and Veterinary Science, and if every Colony has to maintain a complete staff of such experts, it would be a considerable drain on their respective resources. Great economy could, therefore, be effected, if all purely research work could be relegated to a combined central laboratory. Active field officers would be required to operate as at present in communicating to the farmers the information already acquired respecting their farming operations, and the best known methods of dealing with the several diseases of plants and animals with which they have to contend. They would also be the medium for collecting material for investigation at the central laboratory, as well as of supplying collateral information regarding the subjects under investigation.

One great advantage in having a central research laboratory supported by all the British Colonies would be that the combined Colonies would be in a position to appoint the most distinguished men that could be obtained in their respective branches of research work, from which one could reasonably hope that there would be corresponding progress in the work accomplished.

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(17) That the cost of the working of such a Committee will obviously depend entirely upon the nature and extent of the investigations which the Committee will be called upon to undertake, and can only be estimated by the Committee itself, but having regard to the many important questions urgently requiring Research, this Conference is of opinion that the funds to be placed at the disposal of such a Committee should, for the present, not be less than £10,000 (Ten Thousand Pounds) annually, but, nevertheless, the mere establishment of the Committee should in itself entail only a small expense.

While the Conference strongly advocated the adoption in their entirety of the recommendations contained in the above resolutions, it pointed out that, under any circumstances, the appointment of a Committee on the lines indicated should be made as soon as possible for the purpose of concentrating and co-ordinating Research work already being undertaken by the several Colonies in South Africa, and that the mere appointment of such a Committee would not in itself entail any material expense on any of the Governments.

AGRICULTURAL STATISTICS.

Such statistics are issued with census reports, and the last available figures are reproduced in the Statistical Register from year to year until the next report, when the statistics then collected are substituted in the Register for those which had previously appeared. Normally the census would be taken every 10th year, and agricultural statistics, if only collected under this system would, within a few years of the last census taking, be almost worthless as a chronicle of progress or retrogression. The only other agricultural statistical records collected in the interval are returns of the number of sheep and goats in the Colony, and their condition with regard to scab, and also the monthly market prices of certain products. No yearly information is available regarding the production of cereals, vine products, pastoral products, fruit, tobacco, eggs, etc., the rearing of livestock, and the extent of cultivation, other than that furnished by the export returns. The absence of such information makes it very difficult for the Department to form a correct idea of the condition and requirements of the country, and to judge in what channels its efforts should be more particularly directed. The only guide is the feelings of the farming community expressed from time to time at meetings, and the information which the Department's Field Officers may gather. The Agricultural Department is, therefore, placed in the position of largely having to follow public opinion instead of directing it. But it will be necessary, not only to have returns, but also to ensure that they are as nearly accurate as possible, in order that they may serve as an index of progress made or a set-back suffered, and point to the branches of agriculture which require more particular attention.

A system of voluntary information would not suit the needs of the Colony. In the first place, such information would not be forthcoming satisfactorily; in the second place, many people have an objection to giving such intelligence. The most inexpensive and at the same time reliable method seems to be the employment of the police to obtain the required particulars from the farmers themselves and aided by legislation on the same lines as that in regard to census reports.

Agricultural statistics are also an immense assistance to trade, and it is possible that a better knowledge of the productive capabilities of this Colony may exercise a great deal of influence in the direction of utilising the products of the Colony as against imported articles to a larger extent than is being done.

AGRICULTURAL SHOWS.

During the last ten years the following amounts were paid in the aggregate as Government Grants towards Show prizes, viz.:—

	on			basis.
1897-8 … … … … … … …	£2,974	6	3	(Special prizes).
1898-9 … … … … … … …	3,763	10	0	do.
1899-0 … … … … … … …	416	0	0	do.
1900-1 … … … … … … …	269	12	7	($\frac{5}{8}$ of amount awarded).
1901-2 … … … … … … …	324	1	2	do.
1902-3 … … … … … … …	2,434	18	5	do.
1903-4 … … … … … … …	6,361	19	6	do.
1904-5 … … … … … … …	7,383	12	8	do.
1905-6 … … … … … … …	1,769	5	6	do.
	4,282	8	4	(3-10ths of amount awarded)

In 1897-8 twenty-eight Shows were held, and in 1905-6 thirty-nine. This indicates a welcome activity among the farming and industrial community, and claims encouragement from the Government. It becomes, however, a question for very careful consideration how such encouragement could be most advantageously given, always bearing in view that the main object of agricultural shows is educational. The multiplication of shows, while in itself admirable as proof of awakening interest, does not necessarily fulfil the highest requirements. The quality of shows demands attention first, as their educational value is in relation to their quality. Moreover, the utility of shows cannot be measured by the sum total of the prize lists or the Government grants. What opportunities does a show afford for competition? What are the standards for competition? What aims are the competitors set? These are questions which the promoters of shows should have in view. The greater the competition, the greater is the difficulty of winning prizes; and the higher the qualities of the exhibits, the greater is the honour of gaining a prize and the higher is the aim set to those who have failed to receive the coveted honours. One need hardly set down these considerations to make it apparent that a few large shows are more beneficial than double the number of small shows. The argument may be reasonably advanced in support of small district shows that, like the lower class of elementary schools, they serve the useful purpose of stimulating local competition and a spirit of emulation amongst a certain class of agricultural and pastoral farmers who would not be likely to attend or exhibit at the larger shows situated at a distance; hence these local shows become the natural feeders of the larger societies. It must be manifest, however, that the prizes awarded at these local shows would be proportionately smaller than at the larger shows, as the competition is less, very often *nil*, and the quality of the exhibits, except in certain animals or articles for which the district is distinguished, much lower than at the larger shows.

I do not, therefore, at the present stage advocate a revolutionary change. As a commencement, the purpose in view could be more readily achieved by holding shows alternately in districts having such more or less identical interests as East London and King William's Town, Somerset East and Cradock, Paarl and Stellenbosch, to mention some which at once suggest themselves. For these reasons I addressed a letter in September to the Agricultural Union commending to its consideration the possibility of districts which now hold separate shows combining for the promotion of a show of greater usefulness and educational value. The Executive Committee of the Union generally approved of the advisability of circle shows, but felt that it was "impossible to bring about so desirable a state of things for the approaching show season through the machinery of the Union," as "it would take much time and a great deal of persuasive argument to convert those responsible for shows in the districts where such a scheme would be worked." The executive also pleaded for "continuity of policy as regards Government grants. It has always to be borne in mind that the organisers of an agricultural show have to make their plans well ahead, and to do this satisfactorily they must know exactly how they are likely to stand financially." This desire has my cordial support; and I trust that the scale of Government assistance which has been recognised for a number of years, with the exception of last year, and will be reverted to for the 1907 season, viz.: $\frac{5}{8}$ths the amount awarded in prizes in accepted classes, will be regarded by the Government as fixed until there is clear indication that Government aid can be reduced without injury to the objects sought after. These shows are the chief means of demonstrating what advance is being made in agricultural development, and anything likely to interrupt this work is undesirable.

On the 29th November I wrote to the Agricultural Union suggesting that the question of circle shows be brought forward for discussion at its next Congress, in May, and I hope that the project will then receive the approval and support of the delegates.

DEPARTMENTAL EXHIBITS AT AGRICULTURAL SHOWS.

Several Farmers' Associations have asked that the different branches of this Department might prepare for the education of farmers, who may visit agricultural shows, exhibits illustrating discoveries made or results obtained from experiments, or work which is being done, *e.g.*, the results of manurial experiments on vines and fruit trees; species of tick; drawings of insects injurious to fruit trees; indigenous poisonous plants; tree plants suitable for various parts of the Colony; grasses, both foreign and indigenous, the cultivation of which are likely to improve our pastures; Australian fleeces, to show their get-up and quality.

Such exhibits would have to be in charge of an officer who can satisfactorily explain them. They would be shown at the more important shows. The expenditure will be in connection with conveyance principally, and will be very small, considering their educational value.

An effort will be made to give effect to this proposal next year.

EXHIBITION OF PRODUCTS IN LONDON.

The Royal Horticultural Society put forward proposals in 1904 for a series of shows at which the various British Colonies might exhibit their fruits. The dates of the shows were arranged with the intention of affording Australasia, Canada, South Africa, Jamaica, and British Columbia opportunities for exhibiting at the season considered by the Society the most suitable for each Colony. The Fruit Exporters' Association undertook to send fruit to the show held in the end of March, 1905. A further show was held in December, 1905. These appear to have been so successful that the Society was induced to propose the inauguration of a series for 1906 also, and the dates 22nd and 23rd March for the show in which South Africa could participate were fixed in consultation with Cape fruit-growers. Preparations were made in August, 1905, for a larger and more attractive display in 1906 than was made in 1905. The Honourable the Prime Minister, taking advantage of the presence in London of Capt. P. C. van B. Bam, M.L.A., asked him and the Cape Commercial Agent to see how the export of Cape fruit might be increased. These two gentlemen had many interviews with people interested in the Cape fruit trade, and out of these interviews the suggestion arose that the opportunity should be taken advantage of for advertising other products of the Colony as well. They asked the Society, therefore, to allow an additional day for the show. This was consented to, and the hope was expressed by the Secretary to the Society that the Cape should practically fill the Hall with raw as well as manufactured products. Meanwhile, the Crystal Palace authorities asked whether this Colony would exhibit products at its Health, Food and Hygiene Exhibition which was to open on the 7th April, and continue for three months. The Government decided to agree to the proposal of the Crystal Palace authorities, and a Committee, consisting of Mr. J. D. Cartwright, M.L.A., Mr. Louis Cloete, Mr. P. R. Malleson, and myself was appointed for the purpose of procuring exhibits, Messrs. Cloete and Malleson being nominees of the Western Province Horticultural Board. When the proposal for extending the Royal Horticultural Society's Show to South African products in general was received, it was decided to exhibit products which were being collected for the former Exhibition first at the Horticultural Society's Show, and then transfer them to the Crystal Palace. Reports on some of the products, like dried apricots, raisins, currants, almonds, walnuts, prunes and honey were published in the December number of the "Agricultural Journal." Both these shows attracted much attention, and were regarded as successes.

At the Royal Horticultural Society's Show, the following medals were awarded:—Cape Orchard Company, for Colonial Fruits, Gold Medal; T. Micklem, for Grapes and Pears, Silver Gilt Medal (Banksian); W. H. Lategan, for Grapes and Melons, Silver Gilt Knightian; H. W. Hawkins, for Grapes, Silver Gilt; J. Leighton, for Apples, Silver Banskian; C. F. Pfeiffer, for Grapes, Silver Gilt Banksian; K. M. Naidoo and Co., for Colonial Fruit, Silver Gilt Banksian; J. D. Joubert, for Pears and Apples, Silver Gilt Knightian; H. O. Arton, for Colonial Fresh and Dried Fruits, Almonds and Onions, Gold Medal; O. C. M. Barry, for Grapes, Plums, Peaches, Nectarines, Silver Gilt Knightian; A. Nicholson, for Peaches, Bronze Banksian; N. J. Basson, for Grapes, Silver Gilt Banksian; N. J. Smuts, for Grapes, Silver Gilt Banksian; A. C. Buller, for Pears and Plums, Bronze Banksian; Donkerhoek Fruit Syndicate, for Cape Dried Fruit (Prunes), Silver Gilt Knightian; A. B. de Villiers, for Grapes and Pears, Silver Gilt Knightian; Rhodes Fruit Farms, for Colonial Fruits, Gold Medal; Cape of Good Hope Government, for Silver Leaf and Cape Heaths, Silver Flora Medal; C. E. Pillans, for Succulent Plants, Silver Flora Medal; Mrs. Robinson, Hand-painting of Cape Flora, Banksian Medal; Mrs. Schroeder, for Album of Cape Flora, Banksian Medal; Agricultural Department, for Raisins, Bronze Banksia; Shepherd Bros., for Bottled Fruit, Bronze Banksia; Western Province Preserving Company, for Bottled Fruits, Bronze Banksia.

At the Crystal Palace Exhibition, medals were awarded as follows:—Cape Government, for General Exhibit, Diploma of Honour;

Western Province Preserving Company, for Bottled Fruits, Gold Medal; Shepherd Bros., for Bottled Fruits, Gold Medal; F. T. L. Edmeades, for Walnuts, Gold Medal; Mr. J. C. Raubenheimer, for Roll Tobacco, Gold Medal; J. H. Sturk and Co., for Tobaccos and Cigars, Gold Medal; W. J. van der Veen, for Tobacco, Gold Medal; Blatter and Co., for Calabash Pipes, Gold Medal; Chas. Ayres, for Artistic Work, Silver Medal; Miss Connor, for Fish Scale Work, Silver Medal; Vasco Mineral Waters Co., for Mineral Waters, Silver Medal; Van Riebeek Mineral Water Company, for Mineral Waters, Silver Medal; Western Wine, Brandy and Spirit Co., for Curacoa, Special Prize; E. K. Green and Co., for Tinto, Special Prize; Western Wine, Brandy and Spirit Company, for Kimberley Club, Cognac, Muscadel, Silver Medal; H. C. Collison, for Drakenstein, Old Montagu Dop, Silver Medal; E. K. Green and Co., for White Malmsey, Van der Hum, Silver Medal; Western Wine, Brandy and Spirit Company, Eucalyptus Liqueur, Gold Medal; H. C. Collison, for Cabernet Sauvignon, Red Muscadel and F.C. Brandy, Gold Medal; E. K. Green and Co., for Port Wines, Sauvignon Blanc and Pale Sherry, Gold Medal; R. Cloete, for Van der Hum, Gold Medal; H. C. Collison, for Hermitage, Special Prize; Van Ryn Wine and Spirit Company, for Hermitage, Drakenstein, F.C. Sherry and Van der Hum, Gold Medal; for F.C. Pontac, and Sweet Constantias (red and white), Silver Medal; for Sparkling Wines, Special Prize.

Through the instrumentality of Captain Bam, the Royal Horticultural Society consented to leasing its Hall in 1907 for an Exhibition of South African products by all the British South African Administrations conjoined. The suggestion was supported by the Cape Government, and on their representations the Governments of Transvaal, Orange River Colony, Natal and Rhodesia agreed to participate. The cost in England alone was estimated at about £5,000. Towards this amount the Cape Government granted £2,000; the Transvaal Government, £1,000; the Orange River Colony Government, £500; the Natal Government, £500; and the Government of Rhodesia, £250. In addition to these amounts, each Government undertook to spend what it considered necessary for procuring the required exhibits. A Central Committee, responsible for all arrangements in London, was formed, consisting of Captain Bam (Chairman), Sir T. E. Fuller, (Agent-General), and Mr. T. S. Nightingale (Secretary to the Agent-General), representing Cape Colony; the Hon. Sir W. Arbuckle (Agent-General), and Mr. R. Russell, Jun., representing Natal; the Hon. W. J. Palmer, M.L.C., and Mr. Edmund Bourdillon, representing the Orange River Colony; Sir Ernest Blake, K.C.M.G., representing the Transvaal; and the Hon. Sir Lewis Michell, Kt., and Mr. A. Bromwich, representing Rhodesia. In this Colony a Committee was appointed with the aid of the Cape Town Chamber of Commerce, the Western Province Horticultural Board, the Western Province Agricultural Society, and the Fruit Exporters' Association, and consists of Mr. J. D. Cartwright, M.L.A., the Hon. J. A. C. Graaff, M.L.C., Dr. J. H. M. Beck, M.L.A., Mr. T. J. Anderson, M.L.A., Dr. A. G. Viljoen, M.L.A., Dr. J Hewat, M.L.A., and myself as nominees of the Government; Mr. P. Ryan, as nominee of the Chamber of Commerce; the Hon. C. W. H. Kohler, M.L.C., as representing the Western Province Horticultural Board; Mr. A. Barry, as representative of the Agricultural Society; and Mr. T. Micklem, as nominee of the Fruit Exporters' Association. Mr. P. J. du Toit acted as Secretary.

The Exhibition has a two-fold object: (*a*) To show what is produced in the Colony and what opening is presented for the invest-

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ment of capital; and (*b*) To develop the export trade, either by increasing the export of products already known in the British markets, or by drawing attention to articles which are produced or available in sufficient quantities for export.

The Cape Committee set to work about the middle of September. All Civil Commissioners and Resident Magistrates were instructed to call meetings of the public for the purpose of appointing a Committee in each district for drawing up a list of exhibits from which articles required by the Cape Committee could be selected, and to take steps to obtain and forward the exhibits so selected. Farmers and Fruit-growers Associations, Agricultural Societies and branches of the Afrikander Bond were asked to assist the local Committees as far as lay in their power. Local Committees were constituted in 22 districts and the thanks of this Department are due to them for the generous assistance given. After the Cape Committee received the lists of exhibits available from the various districts, it divided into four Sub-Committees, each of which was to be responsible for exhibits in the following classes respectively, viz.:—(1) Miscellaneous industries, base minerals and handicrafts; (2) Agricultural products (including vegetables); (3) Viticultural products and fruit; (4) Pastoral products.

The exhibits are being obtained free, and the Union Castle and Bucknall Steam Ship Lines have kindly agreed to carry free 100 and 50 tons respectively for all the Colonies together.

CHIEF VETERINARY SURGEON.

On my appointmnt to the office of Director of Agriculture, I retained temporarily the position of Chief Veterinary Surgeon. It was found possible to effect the necessary separation in August, and Mr. J. D. Borthwick, M.R.C.V.S., then Senior Veterinary Surgeon in the Department, was promoted to the post of Chief Veterinary Surgeon.

VETERINARY LABORATORY, GRAHAMSTOWN.

On the retirement of the Director of the Bacteriological Institute the Laboratory was transferred from the Colonial Secretary's Department to this for veterinary purposes, and placed under the superintendence of Veterinary Surgeon Bowhill, F.R.C.V.S. This Officer gave notice in the early part of the year that he did not propose renewing his agreement on its expiration in August. It would appear that Mr. Bowhill did not intend to abide by that decision, but in the interests of the Department it was deemed desirable that the acceptance of his resignation should be adhered to. The then Bacteriologist to the Department, Mr. W. Robertson, M.R.C.V.S., was transferred to the Laboratory from Cape Town, with the title of Director. His report of the work of the Laboratory since he assumed control appears in Appendix II.

ANIMAL DISEASES ACT AMENDMENT ACT.

Last Session an Act was passed empowering the Government to destroy cattle which may be found to be infected with Lungsickness or Tuberculosis, and horses suffering from Glanders or Farcy, subject to the payment of compensation to the owners to the extent of half, one-fourth, and one-third the value of the affected animal respectively. The compulsory slaughter of animals affected by these diseases was advocated for several years. The delay in granting such powers can confidently be said to have caused stock farmers a great deal of loss, but the apparent recovery of animals which have contracted Lungsickness or Glanders militated against acceptance of the principle of compulsory slaughter. The passage of the Bill through Parliament is a great step forward. The Act will be promulgated in the Colony proper on the 1st March. The Native Affairs Department are preparing the Natives in the Transkeian Territories for the extension of the Act to those Provinces. Tactful administration of the Act in Native districts in the Colony proper will be a great help in its application to the Territories, as the support of Natives in the European districts is likely to exert influence on the Natives in the Territories. It will be necessary, however, to provide against infection being reintroduced from the Territories into districts from which Lungsickness has been stamped out, and for this purpose the movement of cattle from the Territories into the Colony proper will have to be regulated. This will be done by restricting entry to cattle which have been inoculated. Men should, therefore, be appointed to inoculate cattle which are intended to be introduced, in order that traffic between the two portions of the Colony may not be impeded.

AFRICAN COAST FEVER.

The spread of this disease from Zululand to Durban County, Natal, was reported at the end of August. The first outbreak in that Colony occurred in Zululand, and on account of the transport between the seat of Government and the territory in which the recent rebellion had broken out, the disease quickly spread to Durban County, Dundee and other centres. Immediate steps were, therefore, taken by this Department to guard against introduction of the disease across the East Griqualand and Pondoland borders. A Proclamation was issued closing the borders to cattle, grass-hay and animal produce, and 135 Native Guards were enrolled—60 on the Pondoland border, 15 on the Mt. Ayliff border, and 60 on the Umzimkulu border, all under the supervision of the C.M.R., who again are responsible to the Magistrates. In addition to these, a number of C.M.R. were engaged to guard the Mt. Currie border, on which it was preferable not to employ Native Guards. The existing fence from the Drakensberg to Ingele Mountain was also put in proper repair and strengthened where necessary. It was at first proposed to fence also the section from Ingele Mountain to the sea, along the Umtamvuna River, which is the boundary between Natal and Pondoland. This river was found, however, not to admit of a fence following its course; and again, if a fence were constructed to follow a feasible line, it would cut off the lands of the natives to a large extent. Moreover, the natural boundary to guard against introduction of the disease is the Umzimkulu River; and as the Natal Government are themselves in favour of guarding this river as the temporary boundary, I consider that action should be taken accordingly. The immediate results will be (1) that cattle traffic will be permitted between the Native Territories and Alfred County, which is situated on the Cape Colony side of the Umzimkulu River, and (2) a reduction of the number of guards on the border.

The fence on the Bechuanaland-Transvaal Border is still being energetically guarded by the Cape Mounted Police, and maintained by this Department in a proper state of repair. Though the disease at one time broke out within six miles of the border, within Transvaal Territory, the close supervision exercised has prevented its introduction into this Colony.

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PURCHASE OF THOROUGHBRED STALLIONS.

The amount (£5,000) on the present Estimates for this purpose, in order to foster the industry of horse-breeding, will not be spent this year. It has been deemed advisable to postpone action in this respect in view of the financial condition of the country. I hope it will be possible to place a similar sum on the Estimates for 1907-1908.

DESTRUCTION OF BURRWEED AND OTHER NOXIOUS PLANTS.

The duty of enforcing the destruction of proclaimed noxious weeds falls on Divisional Councils in terms of Act 40 of 1889. A number of Councils employ inspectors to report where such weeds grow, in order that their eradication may be attended to. Active measures are not taken, however, by some Councils, with the result that the good work accomplished in some divisions is sometimes nullified by the inaction of a neighbouring Council. Only uniform measures can ensure success. Spasmodic efforts are unavailing and costly. For this reason, information is being obtained as to the condition of each Division in regard to the existence of such weeds and the lines which are adopted to destroy them. When this information is to hand, the Department will suggest means of dealing with the weeds by which at any rate clean areas will be protected from re-infestation. Until the farmer who has cleaned his holding can be so safeguarded, it will be impossible to control eradication. As is well known, burrweed is a statutory noxious weed. During 1906 the following plants were also declared noxious in the Divisions stated:

"Aplopappus Weed," locally known as "Khaki Bosch" (Tulbagh).

"Prickly Pear" and "Jointed Cactus" (Queenstown).

EXPORT DUTY ON OSTRICHES AND OSTRICH EGGS.

The duty, under Act 24 of 1884, is £100 on each Ostrich and £5 on each egg exported from the Colony, either abroad or to any South African State or Colony in which similar legislation is not in force. In view of the high value which the feathers of some birds now realise, owing to careful breeding and selection, and the consequent great increase in the price paid for birds yielding high class feathers, the time has arrived for considering whether the amount of the export duty is still likely to be prohibitive. The steadiness of the feather market, and the demand for this product, would be a strong inducement to other countries to procure good birds from this country, unless the duty were very much increased. Attempts are being made, as is well known, in Australia and California, to create a similar industry in those countries, and it is, therefore, high time that the industry, which in 1906 yielded £1,412,991 to this Colony, be more jealously guarded. A fair number of birds now change hands at £500 each, and are well worth the price for breeding purposes. It follows, therefore, that it would be worth the effort of other countries to purchase such birds, notwithstanding the present export duty. I would, therefore, strongly recommend that legislation be introduced during the forthcoming Session of Parliament to protect this important industry, and that the other South African Governments be appealed to to pass similar legislation.

BARS IN OSTRICH FEATHERS.

Professor Duerden, of the Rhodes University College, Grahamstown, has undertaken the investigation of the cause of bars in ostrich feathers, with a view to finding preventive means. He receives a small contribution (about £150) from the Government towards the expenses of feeding ostriches, fencing, etc. Farmers are willingly placing birds at his disposal for these investigations. He is very hopeful of success, but it is premature to make any pronouncement at this stage.

CATTLE DIPS AND DIPPING TANKS.

The value of dipping cattle to rid the veld of ticks and stamp out tick conveyed diseases is now well recognised by farmers, and the number of dipping tanks is gradually increasing. Natives as well as Europeans are taking advantage of the experience gained. The Government grant in aid of tanks built by Divisional Councils, Municipalities, Farmers' Associations, or groups of farmers owning not less than 500 head of cattle, was reduced in cost from a maximum of £75 to one of £60 per tank. The cost of tanks for Natives' cattle is, however, met by the District Council, where such a body exists, and in other cases by small amounts levied from hut tax payers. Twenty-three tanks, towards which Government has contributed, are completed, and applications have been received for similar aid towards sixteen others.

Besides Arsenite of Soda, seven brands of cattle dip have been approved by the Department. The privilege of consigning such dips free of railage to their agents, as well as to farmers, has been extended to manufacturers and importers on condition that they charge the same price inland as at the ports. Cattle dips have, therefore, been brought more conveniently within the reach of farmers, who all enjoy an equal advantage as regards prime cost.

PREPARATION OF WOOL FOR THE MARKET.

It is with pleasure that I record the appointment of a Wool Expert. So much has to be done by farmers to improve the get-up of their clips to meet the requirements of the trade, that the duties of the Wool Expert have to be confined for some time to the proper skirting, sorting and rolling of the fleeces. If farmers can be prevailed upon to adopt these throughout the Colony, a great advance will have been made on the present methods of preparing and baling wool for the market. The demonstrations were begun in the principal sheep breeding districts, and were gradually extended to all such districts. The procedure adopted is to call meetings of farmers at the most suitable centres, obtain a small number of sheep with 12 months' wool, have them shorn in the presence of the farmers who attend, and show how the skirting, sorting and rolling should be done. These meetings have on the whole been well attended, and farmers have shown a keen interest in the demonstrations. Practical results have already followed. The sale at Port Elizabeth of wool prepared on the above-mentioned lines by the Highland Wool Growers' Association did not meet with the success which the owners expected for their enterprise, and disappointment was expressed at the prices realised.

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Sheep farmers should not, however, be discouraged by the alleged failure of this individual experiment; it was a new departure from the usual method, hitherto carried out, and it was hardly to be expected that its importance and advantages would be duly estimated, especially by those whose personal interests were associated with the previous practice. It is manifest, however, that when once the wool buyers realise that the leading and progressive sheep farmers of the Colony are aiming at producing a clip of wool which is uniform both in character and quality, and are prepared to place it on the open market, in the most approved manner, for public competition, it will be to the interest of the buyers to secure that wool at its full market price. The market is naturally sensitive, and nothing short of a determined effort that Cape wool shall have a good name among buyers, and a continuous presentation to them of properly skirted and sorted wool will secure enhanced value.

Steps should now be taken to give instruction to young farmers. Arrangements should be made with prominent breeders to allow their sheep to be shorn when the next shearing season commences, under the superintendence of the Wool Expert, and in the presence of young farmers within a convenient radius, who should be given practical lessons in skirting, sorting and rolling. For this purpose another instructor will be required. Farmers have evinced a deep interest in the demonstrations already given, and the tide should be taken at its flood. It is advisable, however, not to move forward with haste in the early stages, and one additional instructor would, therefore, be sufficient; but he would have to act under the Wool Expert, and in full accord with him in order that one standard might be maintained.

SOUTH AFRICAN STUD BOOK.

The first volume of this valuable work has been published. Since the formation of the Cape Stud Breeders' Association in 1904, £1,652 12s. 5d. has been granted to it. During the past year the Association was busily engaged through its sub-committees in having stock inspected which owners desired to be registered. The results of the Association's enquiries were forwarded to the South African Stud Breeders' Association, which body will shortly commence with the preparation of the second volume.

DAIRY EDUCATION.

The Travelling Dairy Expert makes a recommendation in favour of courses of dairy instruction. He says: "Very considerable want is manifest in the Eastern and Border districts of some means of obtaining a knowledge of dairying, and I would confidently recommend for the earnest and favourable consideration of the Government the fulfilment of this want which has so often been expressed to me by farmers and others in those districts. I am certain that until some description of dairy school and dairy classes is established on this side of the Colony the dairying industry will be behindhand. . . . A system of short courses covering, say, a period of from two to three months, would have the effect of stimulating the progress to an incalculable extent."

I thoroughly approve of, say, monthly courses of dairy instruction. Two ways suggest themselves to me, in which they could be carried out:—

(*a*) A course of dairy instruction in the district towns where suitable conveniences can be obtained. It would be necessary to arrange with the surrounding farmers to send in a regular supply of milk or cream, the first for making cheese and the second for making butter. The farmers would receive a certain price for the milk and cream, while the butter and cheese would be sold to cover expenses.

(*b*) There is another method, and a preferable one, in my opinion, and that is to arrange with a large dairy farmer who possesses suitable accommodation to permit the Dairy Expert and his students to undertake the whole of the dairy work on the farm for a given time. At such a farm the great advantage would be that the students would have demonstrated to them the necessity and importance of clean milking, by clean boys, from clean udders, into clean pails, and thereby be able to appreciate the value of the most neglected part in this Colony of up-to-date dairying.

It would be necessary for the Department to provide an additional equipment for these itinerant courses of instruction at farms in the shape of tents, camp beds, etc. The students would be expected to provide their own bedding, cooking utensils, enamelled ware, cutlery, and food, as it could not be expected that farmers would be in a position to board and lodge from 20 to 40 students. This arrangement would be much less costly, and much more convenient to the farming community than establishing one or more dairy schools, in the Frontier and Midland districts of the Colony. For carrying out such a scheme, more than one instructor would be required.

GROOT CONSTANTIA.

Radical changes were made in the early part of the year in the management of Groot Constantia, and as regards the white labour employed. The staff consisted, before the changes were brought about, of a Manager, a Cellar Manager, a Clerk, and some skilled workmen; all these were under the direct control of the Viticultural Expert, Mr. R. Dubois. Close family relationship existed between the Manager (Mr. P. Wyatt) and the Viticultural Expert. Various other circumstances, such as a very adverse report by the Railway Tasting Committee on some of the wines offered to the Railway Refreshment Department, and grave neglect of the orchards, made it desirable, in the interests of the public, to terminate the services of the Manager. Mr. T. L. Watermeyer was appointed in Mr. Wyatt's place from the 15th February, but the latter did not leave until the end of March, in deference to Mr. Dubois's request that he might have Mr. Wyatt's services during the then approaching vintage, in view of the undesirability of a change just when the vintage was commencing. Meanwhile, however, wine bottled and supplied under Mr. Dubois' directions was returned by several purchasers, and a large quantity of wine was recommended by the Government agents, H. C. Collison, Ltd., to be withdrawn from sale. Further, out of six samples of the wine supplied by Mr. Dubois for the Royal Horticultural Society's Show in March, only one was passed by a Tasting Committee, consisting of Mr. J. A. Gird, Mr. L. Cloete, and

Mr. Dubois himself, as suitable for the Show, and it was represented that this verdict was unanimous. These circumstances cast serious suspicion on the condition of the wines in the cellars, and on Mr. Dubois's judgment of the quality of wines; and the uneasiness was aggravated by his refusal to allow wine merchants to taste the wines in the cellars. I accordingly recommended that a commission of enquiry should be appointed, and that their investigations should extend, not only to the condition of the wines, but also to the general management of the farm, as the latter naturally influences the production, and there was, moreover, reason to believe that the use of sugar in the 1904 vintage was, to some extent at least, induced by disease in the vines affecting the ripening of the grapes. The Government acceded to my proposal, and a Commission, consisting of the Hon. C. W. H. Kohler, M.L.C., Hon. H. C. van Zyl, M.L.C., Messrs. G. S. Wolfaardt, M.L.A., L. Cloete, J. A. Gird, and P. Roux was appointed. A unanimous adverse report was submitted by the Commission as regards the condition of the vineyards, cellars, and the majority of the wines, and a reduction of expenditure in salaries and wages of 50 per cent. was recommended. A further Tasting Committee, consisting of Mr. F. Green, Mr. F. Kuffner, and Mr. R. Santhagens, was appointed, and a sample from each vat submitted to them. Their report corroborated that of the Commission on the condition of the wines. From this enquiry certain acts followed; and finally the Government terminated Mr. Dubois' services.

Since then the farm has been under the control of the Manager. The Cellar Manager resigned just prior to Mr. Dubois' dismissal, and left the service shortly after. His place was not filled, and the staff at present, therefore, consists of the Manager and a Clerk. A considerable reduction in expenditure has since been effected, and I am glad to report that the condition of the estate is satisfactory. The report of the Manager appears in Appendix VII. The sales in bottle of high-class wines from the farm have increased up to November of this year, but there was a considerable falling off in November and December. The total realised in 1905 was £1,999 1s. 1d., and in 1906 £1,919 18s. 3d. About 320 leaguers of wine suitable for distillation only were also disposed of by public tender, and a quantity of medium quality wine, which it is not desirable to mature, it is intended to sell in a similar manner during 1907.

The Union Castle Mail Steam Ship Company were approached with a view to their purchasing Groot Constantia wines for sale on the mail boats, and I am pleased to say that the Company has met the Department in this respect, and takes a quantity of Sauvignon Blanc weekly.

GRAFTED AMERICAN VINES: COMMISSION.

In my last report I stated that a Commission consisting of Messrs. R. Dubois, Viticultural Expert, Mr. C. Mayer, Viticultural Assistant, and Mr. L. Cloete, the two latter having been nominated by the Western Province Horticultural Board, had been appointed to investigate the suitability of American vines for the different soils in the viticultural districts, and the affinity between scions and stocks. A difference of opinion arose as to the course the enquiries should take, Mr. Dubois and Mr. Cloete maintaining that a winter inspection in addition to an inspection in summer would be necessary before a definite report could be formulated, while Mr. Mayer considered that a winter inspection would be of no value. Inspections took place in December of 1905 and the following January of the Divisions of Robertson, Montagu, Worcester, Ceres, Tulbagh and Paarl (including Wellington). The funds available for the purpose having been exhausted, an intermediate report was brought up and published in the April number of the "Agricultural Journal." The termination of Mr. Dubois' services in April, and the departure of Mr. Mayer for Europe in February, rendered a continuation of the work by the same Commission impossible.

The use by farmers of different stocks for the same European varieties, and the planting of the same stocks in different soils has, of course, led to a variety of results, and in many instances the failure of some vines. The re-constitution of vineyards, owing to the destruction of European vines by phylloxera, has necessarily been experimental. But these unpremeditated experiments have been on so large and varied a scale that no Government experiments could have equalled them for value. It follows, therefore, that a careful and intelligent collation of the results will supply farmers with a most valuable guide. Then again, the results in one district would probably be totally misleading for the requirements of another district. Under these circumstances, it is necessary, not only to have a correct collation of results, but also to give confidence to the farmers in the judgment of the persons engaged on the investigations. To attain these two objects it was considered desirable to employ Mr. I. Tribolet, the Viticulturist at Elsenberg Agricultural College, whose work on similar investigations in the Paarl district last season in conjunction with two nominees of the Paarl Farmers' Association, at the instance of that body, was highly appreciated by the local farmers, to collect the information available, acting in each district with two farmers appointed for the purpose by the local agricultural association at the request of this Department. The associations in the districts of Paarl, French Hoek, Tulbagh, Worcester, Montagu and Robertson expressed approval of the proposal, and appointed representatives; those in the districts of Wellington and Stellenbosch failed to give any opinion or to take any action, while the Constantia Fruit Growers' Association was opposed to the way in which the Commission was constituted, and was in favour of a standing Commission appointed for a number of years. Seeing that millions of grafted vines of different kinds have been in growth for a considerable number of years in a large variety of soils under varying climatic conditions, it is difficult to understand the grounds (which have not been stated) on which the standing Commission is considered necessary. The enquiries as instituted by the Department, while supplying coherence, are aided by the best practical experience of each district, and give promise of confidence in the conclusions arrived at, while a Commission not so constituted would lack the check which representative men of local experience would bring to bear on dissimilar opinions held in the same district. There were, of course, other ways in which the Commission might have been constituted, the most desirable of which would have been three men of standing, instead of one, to tour all the districts, and to act in conjunction with the local representatives. This would have meant increased expenditure with doubtful advantage, as a highly qualified officer of scientific attainments, aided by local intelligence and experience, would be in no worse position than the same officer similarly aided, acting with two intelligent men whose qualification would be a lengthy experience of the cultivation of the vine in one particular locality only.

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The investigations on the lines put into motion by the Department are proceeding, and the results, at least for the districts whose associations support the action of the Government, will be published in the "Agricultural Journal" as soon as they are available.

WINE, BRANDY, WHISKY AND SPIRITS ACT.

This Act, which was passed last Session, was promulgated on the 7th September, and Regulations were at once framed to give effect to Section 25, which provides that dealers shall be allowed sufficient time to dispose of existing stocks, the sale of which would otherwise be a contravention of the Act. Considerable discussion took place with wholesale and retail dealers, whose wishes were sought in regard to the Regulations in order that they might be in practice as little irksome as possible, while at the same time guarding against defeat of the aims of the Act. The Regulations finally adopted will shortly be published, it being intended to enforce the provisions from the 1st April next.

Much difficulty is apprehended from administering the provision in Section 23, which requires that receptacles of foreign liquors shall bear the name and address of the importer. The only satisfactory way of securing such labelling is to have it done by suppliers in Europe. But the Sherries, Ports, Champagnes, etc., obtained from the European Continent, and bottled and cased six or more years in advance of sales could only be labelled as required by the Act on arrival in Cape Colony. Such labelling would entail the opening of the cases by wholesale dealers, and extra charge by the Railway Department for rail transport of cases which had been opened. This would obviously interfere with, and probably lead to the loss of, intransit trade. If intransit goods were allowed to remain unlabelled, the importers thereof would be under the necessity of keeping two separate stocks, one labelled and one not labelled with their names and addresses, and would have to incur an outlay in excess of their requirements. It is proposed, however, to meet the difficulty by exhaustive analyses of all foreign liquors which are now being imported, so that the Department may be in a position to advise importers which will be permitted to be sold and which not. It follows then that the labelling in question will not be insisted on, subsequent importations being controlled by procuring samples and names of importers on arrival of consignments at the ports and having analyses of samples made forthwith.

VITICULTURE.

Students in Europe.

About the middle of the year the Government received from Professor P. Daniel Hahn, M.A., Ph.D., in pursuance of a proposal made before he left for Europe on tour, the following suggestions for giving Government aid to a small number of young Cape Colonists to proceed to Europe for the purpose of studying the latest methods employed in wine and cognac making, and also diseases of the vine, and the bacteriology of fermentation and diseased wines, viz.: They were to be between the ages of 20 and 25, with some practical knowledge of cellar work and the cultivation of the vine, and should be assisted by the Government to learn European methods of making light wines, sherry, port and cognac. For this purpose, the men selected were to be apprenticed for a year with firms on the Rhine having high reputations, one month of which time would be spent in attending a course of lectures in the Geisenheim Viticultural College on the chemistry of fermentation. At the end of the year they were to proceed to France, Spain and Portugal, remaining in these countries sufficiently long to learn the methods employed there in the cellars and vineyards. He arranged with three firms, in Coblenz, Rudesheim and Frankfort respectively, to take apprentices, who would give their labour in return for the knowledge they would gain, and would be under the same discipline as employees of the firms. Professor Hahn also ascertained from the authorities of the Geisenheim Viticultural College the theoretical and practical course which such students would have to go through. When these proposals were made he was on the eve of touring France, Spain and Portugal, and undertook to make enquiries in those countries as to the terms on which wine firms would take apprentices, and reported later that in Xerez, in Spain, a tutor in sherry making could be engaged for six months; that two firms in Portugal were prepared to receive one candidate each to learn port wine making, extending over two or three years; that a firm in Bordeaux would take two or three candidates for six months to teach them claret making; that a firm in the Medoc would be willing to take one, two or three apprentices who wished to learn claret making; and that a firm in Cognac was prepared to teach cognac making to candidates for three months.

In August, Messrs. P. J. Retief, B.A., G. F. Lindsell, S. W. van Niekerk, and L. C. Versfeld were selected out of 21 applicants, and entered into a contract with the Government, in terms of Professor Hahn's scheme, and proceeded to the Rhine (where he met them) and submitted themselves to his directions as to the firms at which they should be apprenticed. Professor Hahn modified his first proposal, and placed three of the men, Messrs. Retief, Lindsell, and Versfeld at Geisenheim for a year's course, during the first half-year of which they were to attend lectures on Viticulture and cellar management and cognate subjects, and during the second half-year undergo practical courses in bacteriological and analytical laboratories in addition, receiving certain advanced lectures and attending the practical work in the vineyard and the cellar. At the end of the year's work they would be examined in all subjects they have taken, and on the results of these examinations would receive certificates. During the year's course they were to make frequent excursions with their professors and demonstrators to large wine stores, wine estates and wine districts, from the Moselle down to Burgundy.

Mr. van Niekerk elected to be apprenticed, and was placed with Messrs. Joh. B. Sturm at Rudesheim, in terms of the original contract.

Professor Hahn has offered to submit a more definite programme for the further courses in France, Spain and Portugal on his return to the Cape.

FRUIT CULTURE.

Until the end of this year the export of fruit has been confined entirely to private enterprise. In 1899 the majority of shippers formed themselves into an Association, called the Fruit Exporters' Association, with the object of securing better arrangements for disposal of their fruit, both in South Africa and oversea. The high prices which fruit was realising for some years back, the prospect of

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a large and remunerative export trade, and the opening in South Africa for jams manufactured and dried fruit prepared locally, induced growers to plant fruit trees extensively during the last ten years. The increase in production is so great that it has become necessary to give more attention to the export trade. Coupled with this increasing production is the unsettling fact that the prices realised last season in the London market were very disappointing. Mr. C. du Chiappini, who was sent to England by the Government in connection with the Royal Horticultural Society's Show in March last, at which this Colony's fruit exhibit particularly was much admired, took the opportunity of inquiring into our export trade, and on his return to Cape Colony reported that the statement which had been circulated that the low prices which Cape fruit realised in England was due to the market having been flooded was wide of the truth. In his opinion the low prices were to be accounted for by restricted distribution. He, therefore, propounded a scheme which, in his opinion, would give every facility for export, and thereby bring a large number of producers into the trade; would give a Government guarantee to the buyer that the fruit was uniform, of good size, well packed and of approved kinds; and, by opening out the distribution in Europe, would ensure profitable returns to growers. His scheme, summarised, was as follows:—

1. Expert packers were to be sent to fruitgrowers to instruct them in packing.
2. Intending exporters were to deliver their fruit to the Stationmaster and be freed from further action.
3. Once delivery was made to the Stationmaster, the Railway Department were to take responsibility for the fruit until they delivered it in cold storage at the Docks.
4. The expenses thence forward were to be paid by the Department of Agriculture in the first instance.
5. The fruit was to undergo Government inspection in cold storage, and receive the Government mark or brand if passed by the Inspector.
6. The Fruit Inspector was to give details of the shipments to this Department, who would then send advice to England.
7. In England a Fruit Agent was to be appointed to undertake the distribution.
8. Between the date of receiving advice from the Agricultural Department and the arrival of the fruit in England the Fruit Agent would have about 17 days within which to ascertain what the requirements of the European centres were likely to be, and to make arrangements for placing the shipments, according to the probable demands, for sale, which were to be on commission.
9. The Fruit Agent would collect the proceeds and remit them to the Department of Agriculture, who would hand them over to the shippers, less expenses of railage, cold storage, shipping, inspection, freight, and commission on sales.

The scheme also dealt with fruit sent to private individuals on order. In that case the Government was to collect the expenses of rail carriage, cold storage, freight, and delivery in Europe from the shipper either before or after taking delivery at the Railway Station, and was to arrange with a firm of carriers in England for delivery, the purchaser remitting the cost of the fruit direct to the shipper.

This scheme was laid before the Fruit Exporters' Association, the Western Province Horticultural Board, and meetings of farmers at Paarl, Wellington, and Drakenstein. The Fruit Exporters' Association, whose members were said to number about two-thirds of the present exporters, was the body chiefly concerned. At the end of August a deputation from the Association interviewed the Secretary for Agriculture at his request in order to discuss the scheme. The deputation was not satisfied that the low prices received by them during the previous season were due to the cause attributed by Mr. Chiappini, and did not feel disposed to make a change in their arrangements which had worked well during six years previous to 1906, viz.: Consignment to commission agents under contract, and distribution through them to fruit dealers. It was recognised by the Department that unless the co-operation of exporters could be secured, the scheme could not be considered. Subsequently, a further deputation from the Association discussed the proposal with the Government, and agreed to accept the appointment of a fruit agent in England on the lines of Mr. Chiappini's proposal, and were in favour of Government inspection prior to export, but insisted that the fruit agent should act in conjunction with, or under, the Association's commission agents; a charge to be made to shippers of not more than 1d. per box for inspection here and distribution in Europe. This proposal fell through, as the scheme was unworkable on these lines. The Government, however, agreed to institute a system of voluntary inspection at the Docks of export fruit.

Enquiries into the export trade will be continued during the coming season, but the prices realised must very largely determine further action. If private enterprise can obtain good prices, there is no warrant for Government intervention, except as regards inspection at this end. On the other hand, unless there obtains in Europe a system of distribution which will secure the shippers the best prices obtainable, Government inspection at this end is futile.

FRUIT DRYING AND PACKING.

Several Companies are now in existence in the Worcester, Paarl and Stellenbosch Divisions. Great improvement in drying has taken place; there is greater uniformity of quality, and packing by these Companies is done in an attractive form. A large quantity of fruit is, however, dried in the most primitive way, and does not find a market. There is much room for improvement in the raisin industry. We have excellent grapes in the country for this purpose, but the supply of first-class raisins is very limited, and it is at present impossible to obtain a suitable article throughout the year, notwithstanding that the material is at hand. Now that the prices of wines are rapidly declining, the time is ripe for bestowing more attention on raisin making. Again, the large crops of fruit and the increasing number of trees which are coming into bearing afford the most favourable opportunity for developing the fruit drying industry. The present is, therefore, the most suitable time for the appointment of itinerant instructors in drying and packing. The demand which arose last year for dried apricots should stimulate Cape growers, and the opening which there is for Mebos on the London market should also be met in order that a trade in this Cape speciality may be developed if possible.

APPOINTMENT OF A MYCOLOGIST.

In my last report I indicated the necessity for appointing a Mycologist. The engagement of such an Officer is still being urged on the Government by the Western Province Horticultural Board and the Vine and Fruitgrowers' Congress, and I hope it will be possible to provide the funds for this purpose in the next Session of Parliament. Hitherto the Transvaal Government has generously come to our assistance in determining and advising upon fungoid diseases,

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but the calls from this Department upon the Plant Pathologist attached to that Government are increasing so rapidly that the appointment of such an officer for this Colony has become imperative. In the belief that a list of the questions which the Transvaal Plant Pathologist has under investigation for this Government will carry conviction better than a general statement, I append it:—Bitter-pit in Apples; *Fusicladium dendriticum*, affecting Apples; *Fusicladium pirinum*, affecting Pears; Poplar Fungus; Tomato Rot; Eucalypt disease; Grape vine disease, Oidium; Bean rust; Fungus on *Phœnix canariensis*; Root rot of Poplars; Onion disease; Naartje fruit spot; Kei-apple disease; Potato disease, *Macrosporium solani*; *Fusarium limonis*, affecting Citrus trees; Barley fungus, *Helminthosporium teres*; Rye rust; Barley smut; Wheat disease, "Black stem rust"; Red scale fungus; Variegated Apple leaves; *Glocosporium ampelophagum*; Apple-split fungus; Water core in apples; Pelargonium rust; Mulberry disease; *Leptothryium pomi*, affecting apples; Oleander disease; Peach freckle; Disease in *Pinus pinea*; Disease in *Pinus insignis*; Galls on *Acacia horrida*; Disease in *Pinus tæda*; Maize rust; Cape Gooseberry disease; Prune disease; Plum disease; Podocarpus disease; Fig disease.

With regard to some of these, Mr. Pole Evans, the Transvaal officer referred to, writes:—

> "'Bitter Pit' in Apples, as you are aware, has been investigated in great "detail. It has hitherto completely baffled plant pathologists all the world over "wherever the disease is found. I have obtained certain facts of some significance, "the following up of which I feel confident will eventually solve the mystery.
>
> "But there are a number of other diseases which I have felt it my duty to "the country as a whole to expend no little time and labour over.
>
> "The obscure Pine disease is one of vital importance to Cape Colony, and "should be investigated without delay.
>
> "The Cape Gooseberry disease, which I found was due to the fungus *Entyloma*, "has caused growers in that Colony no end of trouble, and is likely to cause them "even more, for I have found experimentally that one of our most common South "African weeds, *Physalis minima*, carries the same fungus.
>
> "An obscure Prune disease is another trouble which must be investigated on "proper lines before they can hope to remedy it.
>
> "All these pests should be tackled one by one. To be worked out properly, "any one of them may require one man's sole attention for three or four years, or "even more. These are only some of the more pressing problems."

It is not right, nor is it pleasant or dignified, to ask for so much assistance at the expense of another Government. Our problems are both numerous and pressing, and they should be placed in the hands of an officer whose investigations could be carried on without the likelihood of interruption, because an investigation uncompleted requires to be begun afresh if transferred to another officer, and the time expended on it is therefore lost. There is no certainty that the assistance which we are receiving from the Transvaal Agricultural Department will long be continued; they have sufficient work of their own to occupy the attention of their Plant Pathologist. It would, therefore, also be unwise to rely on their aid.

LOCUSTS.

The system inaugurated by the Government Entomologist for the collection of information as to the movements and breeding grounds of locusts referred to in his report will, it is hoped, furnish data for a systematic campaign against this pest. Destruction with any success can only be undertaken in the voetganger stage. It is necessary, therefore, that the work be undertaken soon after hatching. The wide extent of the locust infested area renders it essential, if destruction is to be of any benefit, that a number of men should be employed simultaneously for the purpose. The scheme suggested by the Government Entomologist, of which I approve, is:

1. Legislation on the lines of the Natal Act, which empowers the Government:—
   (*a*) To proclaim locust areas and to call upon the owners or occupiers of all properties therein to take such steps as may be directed for the extermination of voetgangers on their lands.
   (*b*) To have the voetgangers destroyed by Government employees at the owner or occupier's expense if the latter fails to carry out the order to have them destroyed. The costs may be recovered in civil suit.
2. Continuance of the present practice of supplying arsenite of soda gratis, loaning pumps, and assisting in the purchase of soap.
3. Appointment of local officers throughout the locust area for the period of the voetganger season, to
   (*a*) Instruct farmers and others in the knowledge and use of remedies.
   (*b*) Facilitate the distribution of supplies.
   (*c*) Destroy swarms on unoccupied lands and supervise measures on native reserves, etc.
4. Division of the locust area into sections, and the appointment for the season in each section of an officer to see that the local men work satisfactorily.
5. Appointment of a Chief Locust Officer to supervise and direct operations as a whole.

The obtaining of information by means of post card correspondence of the breeding grounds is meeting with support from farmers; but it cannot be expected that they will continue to supply information if it is to be of academic value only. If practical results were to follow from this effort, interest in the work would be stimulated, and there would be a likelihood of even more definite details being made available. I trust, therefore, that the proposal made last year for a vigorous campaign of destruction, but postponed on account of financial stress, will be given effect to during next season, 1907-08. The amount recommended for this purpose for the current year was £7,500; the sum voted was £500. Such an amount suffices only for the loaning out of a few hundred pumps, the free supply of arsenite of soda, and a contribution towards the cost of soap, to a few energetic farmers spread over about half the Colony. Government assistance on so small a scale gives only temporary good results in limited areas, and, on the whole, serves no good purpose. Resolution at Farmers' Congress meetings and by the Legislature in favour of concerted action with the neighbouring Colonies were duly communicated to the Governments concerned, and co-operation urged, but while Natal, Transvaal and the Orange River Colony are spending many thousands of pounds in an endeavour to save crops and pastures, this Colony has so far been practically inactive. The following are the amounts set aside by the four Governments mentioned for locust destruction during the present year:—

Natal	£5,000
Transvaal	£12,000
Orange River Colony	£7,000 to £8,000
Cape Colony	£500
Basutoland	£2,000

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DESTRUCTION OF VERMIN.

During 1906 the following amounts were paid as rewards for destruction of wild carnivora:—

Name of Animal.	Number Killed.	Rewards Paid.
		£ s. d.
Red Cat (Lynx)	2,041	357 0 6
Red (or Silver) Jackal	23,039	11,519 10 0
Do. pups	1,712	214 0 0
Baboon	3,864	241 5 6
Totals	30,656	£12,331 16 0

A Bill was introduced last Session of Parliament providing for the granting of loans for the erection of, or conversion of, existing fences into, vermin proof fencing, but the measure did not reach the second reading. Such a Bill was advocated in my last report, in which I also said that the grant for 1905-1906 (£10,000) would probably fall short of the amount required. The actual expenditure was £12,518 17s. 1d. For the first six months of 1906-7 £6,439 5s. 6d. has been paid out, which would make the total expenditure for the present financial year, on the same basis, about £12,878, whereas the provision is £10,000. Since rewards were first paid, viz.: 1889, £144,367 19s. 10d. has been expended. The battle has been mainly against the jackal, for 227,840 of which rewards have been paid in the past ten years. But these include a large number of jackals of species which are not destructive to stock, and for which rewards were formerly paid in ignorance of the habits of these species. However, the system which has contributed so largely to the object of extermination of this animal has, judging by results, no doubt been beneficial; and the reluctance of farmers to change this system for any other of whose benefits they have not had proof, commands our respect. At the same time, one has to take the following figures into consideration. The number of jackals for which rewards have been paid are for:

1904	30,802*
1905	19,694
1906	24,751

These figures do not show that rewards alone bring about a reduction in the number of jackals. Again, it is repeatedly asserted by men who have tried jackal proof fencing that they can get rid of jackals on their farms by confining them within the boundaries of their farms and then destroying them; that they have been able to let their stock run without kraaling; that the percentage of increase in their small stock has been much higher since the vermin proof fencing was erected; that it has improved their pasture and given other advantages as well. I therefore remain strongly in favour of this course being adopted, recognising at the same time that, even if loans were granted, it would still be necessary to pay rewards, as it will be a considerable time before fencing of this description will have been extensively done, and because in some parts of the Colony the extent of the holdings will render fencing prohibitive. The two systems should, therefore, run concurrently.

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* Including harmless species.

But to further encourage the erection of jackal proof fencing, I would recommend that material for such fencing be carried on the Government Railways at half the usual cost, or even free, *i.e.*, that a sum be set aside on the Estimates of this Department for paying half or even the whole cost of railway conveyance of the material. The annual grant of £10,000 for payment of rewards might then be reduced to £7,500, the rewards lowered, and £2,500 provided for payment of such railage.

As the rewards for the first half of the present financial year were in excess of the provision on the Estimates, and there was urgent need for retrenchment, rewards were stopped on the 31st December; and it is proposed to bring the question of destruction of vermin forward prominently during the next Session of Parliament.

A NOXIOUS ANIMALS BILL.

At the Conference of South African Entomologists held in August, some attention was given to the question of the importation of noxious birds and insects, reptiles and predatory animals, and the introduction of legislation which will enable the Government to control such introduction was recommended. I am in full accord with this proposal, and a Bill is being drafted on these lines. The intention is to require that a permit be obtained for such introduction, but it is advisable that the Government should have the power to prohibit absolutely the introduction of any particular animal, bird, etc., should circumstances or experience render that necessary.

The first step proposed to be taken is with regard to bees. The Government Entomologist writes:

> "The measure is one of considerable importance. One of the first directions for its use would be for the exclusion of bee disease. The honey industry in the Colony is a phase of agriculture which deserves fostering. Foul brood and similar diseases are utterly unknown in South Africa at present, and if they get in they are certain to give the industry a tremendous setback, as they have in New Zealand, Australia and America. The Australian honey supply is said to have dropped fifty per cent. quickly when foul brood appeared, and the importance of this disease in America may be judged from the fact that twelve States have special legislation with the object of its suppression. Despite of all that is done, however, a recent official bulletin from Washington says, *inter alia*: 'The spread of diseases of the brood of bees is to-day a special menace to the bee keeping of the United States.' The Department is in a position to import and breed any new strains of bees that may be thought advisable, and by such a step the need for any private party making introductions might be removed. Moreover, should a Government apiary for the supply of queens be established, it is highly probable that the other Colonies would gladly follow our lead in prohibiting all private introductions. The Transvaal has already arranged that its introductions be under permit, and that they be kept in quarantine for a period.
>
> "It should be borne in mind that in this country the control of the diseases would prove immensely more difficult than in older and more thickly settled countries, and that in some parts wild bees not amenable to inspection are numerous. This accentuates the advisability of measures to exclude their introduction."

A fairly large importation of bees has taken place into Rhodesia, and some swarms were introduced from Italy into this Colony within the last few months, and into the Transvaal about two years ago, with the object apparently of getting improved strains into South Africa. This can, however, be accomplished by the importation of queens under Government supervision or control. The largest bee-keeper in this Colony is of opinion that a considerable export trade can be opened up in honey if the industry be organised; and the British reports which we have received on honey sent to the Royal Horticultural Society's Show, 1906, are very favourable. Foul brood may also be introduced with honey and bees-wax, and it will probably be advisable to issue a regulation that importations of honey and bees-wax should be accompanied by guarantee of freedom from this disease.

Next, importation of starlings into this Colony is likely to prove very harmful to the fruit trees. Already reports have been received of the destruction caused by them in the Cape Peninsula. They are reported to be a pest in Australia, and the rapidity with which they increase, and their social habits, may produce the same result here. It would be wise, therefore, to have legislative powers for controlling the importation of birds which are likely to become destructive.

Western Australia has legislation against destructive birds and animals, Queensland against noxious birds, and New Zealand against noxious animals, birds and insects, and also against reptiles.

TOBACCO CULTURE.

The very favourable reports on the quality of Turkish tobacco raised by Mr. Stella at Frenchhoek induced the Department to employ him to supervise the laying out of seed beds and the cultivation of the plant on ten farms in the Frenchhoek and Drakenstein areas. The crops will be reaped in the early part of 1907, and the curing will be superintended by Mr. Stella. Hopes are entertained that these portions of the Paarl district will prove suitable for tobacco culture. If so, the trials which are in progress will be educative to the farmers in those parts, and probably give a stimulus to the industry. An application by the Oudtshoorn Farmers and Fruit Growers' Association for advice regarding the flue curing of tobacco was welcomed, and steps were taken to comply with the request. The Association found itself unable, however, to erect the necessary barn, and has deferred the proposal till next season. A member of a prominent Cape Town manufacturing firm is sanguine that Tulbagh Valley and part of Piquetberg district present very suitable conditions for growing first class tobacco. But the methods of cultivation and preparation require to be improved; and I hope provision will be made on the next Estimates for demonstrations in flue curing.

The faith of manufacturers in the possibility of turning out a leaf of high quality, and the efforts which several of them are making to place the industry on a higher level is of good augury for advancement in this direction. The livelier interest in the matter which farmers themselves are showing may soon render it necessary to appoint a fully qualified expert to enable the Department to give the industry fuller attention.

POULTRY.

The Western Province Agricultural Society has set a laudable example in undertaking the conduct of an egg-laying competition. The Cape Town and District Poultry Society was anxious that the Government should institute such a competition; but, while the matter was under consideration, the Agricultural Society took the lead. As the arrangements made by the Agricultural Society were sufficiently complete to meet the object sought to be attained, the need for a similar competition under the control of the Government was removed. It appears to me to be essentially a matter for Agricultural Societies and Farmers' Associations, especially the latter, as such bodies can conduct them far cheaper than the Government, with more advantageous results, since the number held would be considerably larger than the Government could undertake in the same space of time, and members of the Associations would take a more practical and active interest in the competitions. These should always include the ordinary or barn-door fowl.

Improvement in poultry breeding is marked in the urban areas, but slow in the rural portions of the Colony; and Farmers' Associations can therefore do much to make poultry-keeping more profitable as a side line than it is.

The dimensions of the egg trade of Europe, and particularly of Great Britain, though not affecting breeders here, serves to indicate with considerable force how important an industry it is.

Pratt states in "The Organisation of Agriculture," that Denmark exported to England in 1902 eggs to the value of £1,270,000, representing 422,000,000 eggs, while Great Britain in the same year took from France £900,000 worth, and from Russia 640,000,000 eggs, besides smaller quantities from Austria, Roumania, Egypt and other countries. Probably the absence of a system of collection and distribution, a factor which enabled the countries named to supply the English market, accounts to a large extent for the little interest taken here in the breeding of poultry; but poultry competitions may act as a stimulus to the improvement of breeds, at any rate near urban centres.

The production of eggs of good size, uniformity in size when marketing, preservation in times of over-supply, and an approach to regularity of supply should render it impossible for eggs to fetch 3s., or even 2s. 6d. per dozen at any time of the year.

PRICKLY PEAR AND PRICKLY CACTUS.

Last Session a Select Committee was appointed by the House of Assembly to consider the best means of preventing the spread and securing the destruction of Prickly Pear and Prickly Cactus, and of assisting farmers and others in this object. The Committee brought up a report recommending compulsory extirpation with State aid according to a graduated scale, by which the Government should contribute 1-8th of the cost if under £100, 1-4th if £100 or under £500, 1-3rd if £500 or under £1,000, and half if £1,000 or upwards. Once an area was clean it would be obligatory on the owner to keep it so. The Government and public bodies were to have similar duties imposed on them in respect of Crown or public lands. The Committee recommended immediate legislation, but at the same time urged on the Government "the desirability of carrying out experiments with all such preparations and processes as may appear feasible, with a view to ascertaining and demonstrating the most effectual and economical means of dealing with both species of Opuntia." About 15 years ago, experiments were conducted departmentally and, as a result, a pamphlet was issued recommending farmers to uproot the plant and stack it, pricking each layer successively, and spraying it with Arsenite of Soda. This method was from time to time favourably reported on by farmers, and a great deal of useful work was accomplished in this way. Many farmers, however, have taken no steps to get rid of the pest, and while this attitude continues, farms which are not cleared will always remain a source of danger to other properties in the neighbourhood, considering that any portion of a plant will strike root where it may be dropped. Mr. P. J. Pienaar recently patented a preparation for destroying Prickly Pear. This has been reported to give satisfactory results, destruction being effected by means of injections of the chemical into sections of the growing plant. While Mr. Pienaar's preparation is sold at about double the price of Arsenite of Soda, the cost of uprooting and stacking, speaking generally, is saved to the farmer. Other preparations have also lately come into the market.

Legislation on the lines recommended by the Select Committee would involve large expenditure. It has been roughly estimated that the infested area is about 500,000 morgen. I am inclined to think it is a great deal more. Some farmers reckon that the average cost of clearing ground of Prickly Pear under the method recommended in the Departmental pamphlet is about 5s. per morgen. If this may be taken as a guide, the cost of clearing 500,000 morgen would be £125,000, and the expense to the Government under the Select Committee's scheme would in that case probably be about £50,000. But it would be a hardship to farmers to compel them to destroy Prickly Pear and Prickly Cactus under the present methods if the cost could be lessened, and unfair towards the general taxpayer. The suggestion of the Committee that further experiments be carried out is, therefore, being acted upon. Until these experiments are completed, it seems desirable that legislation should be delayed.

"AGRICULTURAL JOURNAL."

This publication was first distributed free to members of Farmers' Associations and Agricultural Societies, and the free list was subsequently, in conformity with a Resolution of the House of Assembly passed in 1893, limited to members of Agricultural Societies. It is interesting to recall that two amendments were proposed to the Resolution of 1893—one, that the Journal should be supplied to farmers on the most reasonable terms, and the other, that it should be sent free to any farmer who applied through a Magistrate. Both the amendments were withdrawn, and the anomaly confirmed of denying an agricultural publication to agriculturists unless they paid for it, and supplying it free to a number of men following other vocations, because they were members of Agricultural Societies. Subsequently members of Fruitgrowers' Associations were placed on the free list; but some Farmers' Associations circumvented this limitation by re-naming themselves "Farmers and Fruitgrowers' Association." It has been felt for some time that the position was untenable, and that the Journal could be made to serve a far better purpose by revising the free list and giving farmers the first call upon the free copies. But as such a change involved increased expenditure, it was deferred for a time. The decided expression of opinion by members of the House of Assembly last session, however, in favour of the above view, was taken advantage of for introducing the change. The farmers who register their applications with Magistrates receive the Journal free from the 1st January, 1907, in English or Dutch, as they may desire. At the same time, a small number of copies is supplied free to Agricultural Societies for circulation among their town members. The free list of English copies has remained at about 6,000, and the Dutch copies have increased from about 1,500 to about 5,000, making a total gratis circulation of about 11,000 copies per issue. The increased expenditure which the change will entail should be far outweighed by the indirect benefits which, it may reasonably be assumed, will accrue.

PRESERVATION OF GAME.

It is a matter for regret that owing to the pressure of other business it was not found possible to submit the Game Preservation Bill mentioned in my last annual report for the consideration of Parliament last session. It is hoped, however, that this necessary measure will become law during the ensuing session. It is as well perhaps to briefly recapitulate its principal provisions, and with this end in view, the following extract from my last report is subjoined:—

> "Great attention will be paid during the ensuing game season to the matter of the issue of permits to shoot large or 'Royal' game, and the time has now arrived when, in my opinion, sportsmen wishing to indulge in this luxury should be prepared to obtain a special licence at higher rates than those charged for the ordinary game licences. This is the universal practice in other parts of the world, and has been found to work advantageously from all points of view. A clause to this effect will be inserted in the proposed legislation which it is intended to submit to Parliament during the next Session. *Bona-fide* landowners, shooting on their own land, will, of course, be exempted from having to take out this licence.
>
> "The proposed Bill also includes certain provisions dealing with the question of the export of the hides, horns and tusks of certain animal game, the shooting of elephants, and the registration of their tusks.
>
> "These clauses have been inserted in conformity with a Convention subscribed to by the various Powers having territorial interests in Africa.
>
> "Influential representations having been made on the subject, a clause has been introduced giving the Governor, on the recommendation of the Divisional Councils concerned, power to restrict the sale of game, with a view to preventing the indiscriminate destruction which has been indulged in by some persons for the purposes of sale. No hardship will be inflicted on *bona-fide* sportsmen.
>
> "It has frequently happened in the past that applications have been made to the Department for permission to kill or capture birds or animals for scientific purposes during the close season; also cases have occurred where a buffalo or one of the larger antelopes on private property has developed predatory habits, destroying crops and gardens. Under existing legislation, should such birds or animals be protected at the time, the Governor is not empowered to authorise them to be captured or killed, except that he may issue permits in respect of the young of birds or animals required for scientific purposes or acclimatisation.
>
> "It is now sought to amplify these powers in the direction above indicated. No apprehension need exist as to unnecessary destruction of game taking place as a result, as, the matter being in the hands of the Government, the greatest care would be taken to enquire into the *bona-fides* of such applications before granting them.
>
> "A clause dealing with the imposition of a tax on dogs of the greyhound variety in rural areas has been introduced in deference to a generally expressed wish, that some check should be exercised over the large numbers of these dogs kept by persons who employ them in the illegal pursuit of game.
>
> "It is also proposed, subject to certain exceptions, to prohibit the trapping of game. This is merely in conformity with universal practice, and is highly necessary in the interests of successful preservation. It cannot be urged that trapping is necessary, as, should circumstances warrant such a proceeding, *e.g.*, in the case of acute distress in a district where large numbers of game may exist, legislation exists for temporarily removing any species of game from the protection afforded under the Game Laws.
>
> "Influential representations have also been made that the night shooting of game should be prohibited, and this has been given effect to in the Bill, subject, however, to the desire of the Divisional Council of the district concerned."

No further developments have taken place in connection with the proposed establishment of a Game Reserve in Bechuanaland owing to the expenditure which would be entailed thereby. Definite proposals have, however, been evolved so that, when funds for the purpose are available, an immediate start may be made with carrying one or other scheme into execution. It is unnecessary to point out here the advantages to be derived from the establishment of a suitable reserve but, if the Colony is to be spared the reproach of allowing the last representatives of its beautiful fauna to pass into oblivion, the matter should be taken in hand without needless delay. The numbers of large game in the Colony remain much the same as last year. The existence of a few hippopotami in the lower reaches of the Orange River has been placed beyond doubt by evidence from several reliable and distinct sources.

Complaints as to the indiscriminate destruction of game upon Crown land having from time to time been received, both from private individuals and public bodies, steps have been taken whereby any person desiring to shoot upon Crown land will have to obtain a licence therefor at a tariff which will be arranged; and it is expected that this will in great measure, if not indeed entirely, remove the evil complained of. Finally, it may be said that there would appear to be a growing interest in the public mind in the question of game preservation. This is a welcome sign, and every encouragement will be afforded by the Department. In this connection, the assistance of all influential bodies and individuals is earnestly besought in order that the labours of the Government in this direction may be seconded as strongly as possible.

BERRY WAX.

A quantity of berry wax (or Myrtle Wax, as it is known in Australia) was sent to the Royal Horticultural Society's Show in 1906. An analytical investigation of it was made at the Imperial Institute, and the results were submitted to a firm in Liverpool, who made a trial offer to take 10 tons for £29 per ton, landed at Liverpool. Enquiries were made of several dealers at Somerset West whether they would take advantage of this offer, or inform this Department what quantity they would supply, in order that a 10 ton shipment might be accumulated and forwarded. At one time it seemed that the quantity would be forthcoming, but ultimately the attempt met with no response. The plant (*Myrica cordifolia*), from which the wax is obtained, grows along the sea-board from Somerset West to Simon's Town, and has spread along the foot of the Muizenberg range. It is said to have been introduced by the Forest Department for arresting drift sands, since which time it has multiplied to a considerable extent. The collection hitherto has been erratic. Coloured people are said to strip the bushes, heat the berries in pots or smaller vessels to melt the coating of wax which surrounds the berries, skim off the wax and place it in a mould of any shape to solidify. The wax is then taken to a shopkeeper and either sold or exchanged for groceries or other necessaries. The quantity collected only amounts, as far as can be ascertained, to a few tons a year; and this small supply meets with sufficient demand for floor polishing, and perhaps other uses, to keep the price at from 3d. to 6d. per lb. It is evident, therefore, that £29 per ton landed at Liverpool, which works out at a small fraction over 3d. per lb., is not sufficiently tempting under present conditions of supply. Further enquiries made in

England place the probable commercial value at £33 per ton at the outside; but the real value can only be ascertained by trial in the factory. It is impossible to gauge the probable output until some systematic efforts at collection are made. So long as people collect only sufficient berries to procure their immediate wants, the price must continue comparatively high, not only because the supply remains limited, but also because the cost of melting in small quantities is relatively high. This Department has promise of a collection on business lines during the forthcoming season (about May to September) with a view to export.

It would appear that this wax is well known in the United States of America, and is used there in the manufacture of candles and soap; but even if an export trade cannot be opened up on account of excessive cost, there seems to be no reason why the article should not be exploited in our own Colony, instead of being allowed to go to waste on sand dunes and mountain sides.

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APPENDIX I.

REPORTS of the Chief Veterinary Surgeon and Assistant Veterinary Surgeons for the Year 1906.

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I have the honour herewith to submit my Annual Report for the past year, but as I only arrived at Cape Town on the 11th of August to take over the duties of Chief Veterinary Surgeon—the appointment dates from the 19th July only—my observations will necessarily be somewhat brief.

The following is a full list of the Veterinary Officers serving on the Technical Staff at the end of the year:—

R. W. Dixon, M.R.C.V.S., Assistant Veterinary Surgeon	East London.
M. A. Hutchence, M.R.C.V.S., Assistant Veterinary Surgeon	Kokstad.
G. W. Freer, M.R.C.V.S., Assistant Veterinary Surgeon	Uitenhage.
J. Spreull, M.R.C.V.S., Assistant Veterinary Surgeon	Somerset East.
J. A. Robinson, M.R.C.V.S., Assistant Veterinary Surgeon	Mossel Bay.
A. Goodall, M.R.C.V.S., Assistnat Veterinary Surgeon	Worcester.
C. Goundry, M.R.C.V.S., Assistant Veterinary Surgeon	Cape Town.
J. H. Lyons, M.R.C.V.S., Assistant Veterinary Surgeon	Grahamstown.
W. G. Pakeman, M.R.C.V.S., Assistant Vetinary Surgeon	Molteno.
S. Elley, M.R.C.V.S., Assistant Veterinary Surgeon	Oudtshoorn.
R. Paine, M.R.C.V.S., Assistant Veterinary Surgeon	Elsenberg.
P. X. Kearney, M.R.C.V.S., Assistant Veterinary Surgeon	Umtata.
*W. Simson, M.R.C.V.S., Assistant Veterinary Surgeon	Mafeking.
*W. Jowett, F.R.C.V.S., D.V.H., Assistant Veterinary Surgeon	Cape Town.

*Arrived here 23rd and 30th October respectively.

STAFF.

I beg to take this opportunity to thank the whole of the Professional and Clerical Staff for the exceedingly kind manner in which they have accepted me as their Chief. It has been very gratifying to me, and I trust that I shall be able to retain their confidence.

To occupy the position so long held by so able and popular an officer as Mr. Hutcheon makes my agreeable reception by the Staff more pleasing on that account.

I regret exceedingly to have to record the loss of Veterinary Surgeon Neill, who died at Vryburg on the 24th December from Syncope; his loss was greatly felt by the farming community of Bechuanaland, where he had made himself very useful, and gained the confidence of the Public.

Veterinary Surgeon Bowhill's engagement terminated on the 13th August last, on which date he left the service of the Government.

In acknowledging the work done by the Clerical Staff my especial thanks are due to the Secretary, Mr. Du Plessis, who controls the correspondence, his ability to do so in such an efficient manner having been gained after many years' work under Mr. Hutcheon, and which I now find invaluable.

STATUS OF VETERINARY STAFF.

The status of the Government Veterinary Surgeons is far from satisfactory, there being no scale of increase of salary laid down, consequently those who join the Service are in blind ignorance of their prospects, and their services may at any time be dispensed with.

Considering the largely increased capital invested in Live-stock in this Colony, I consider the time has now arrived when the Veterinary Staff should be established on a firmer basis to give investors in stock greater security. I feel confident that large tracts of grazing at present unoccupied would be taken up and stocked if breeders were assured of competent veterinary advice and assistance.

To cope with the demand for the services of the Veterinary Surgeons, I would suggest that each Veterinary Surgeon be allotted a certain defined area, having employed under his direction several young laymen selected for their suitability for the work, who would be given a sufficient course of training to enable them to perform the large number of inoculations which are now done annually to arrest the spread of contagious and infectious diseases, and also to carry out treatment of minor ailments.

Farmers are yearly becoming more alive to the advantage of protective inoculation. This class of work, and also castration both of Live-stock and Ostriches, take up a great deal of the Veterinary Surgeons' time, which could more profitably be devoted to the investigation of obscure diseases, and their treatment. For example, Veterinary Surgeon Elley has during the year performed 450 castrations upon horses and donkeys alone, the satisfactory results attending upon which have led to a great demand for his services in that direction. Castration was initiated to demonstrate to the farmers the different methods in practice, and not intended to become a general duty. To meet the necessary expense in some degree, I would recommend that a tariff of charges be made for such work, which the owners of stock would, I think, be willing to pay.

CORRESPONDENCE.

Correspondence.	1905.	1906.	Decrease.
*Number of Letters, &c., Outwards	5,396	4,203	1,193
* Do. Inwards	7,288	7,174	114
Number of Telegrams, Outwards	966	871	95
Circular Letters, Outwards	31	18	13

* Only the more important correspondence is herein recorded. much of our communications with Magistrates on animal diseases over the whole Colony and Transkei being now done by means of printed forms, which. though entailing a large portion of the actual work, is not shown in the Return.

STATISTICS.

The Statistical Tables for 1906 are presented herewith, and should prove more interesting as the totals for 1905 have been reproduced for comparison purposes.

It will be noted (see Annexure 1) that the total number of outbreaks reported during 1906 have increased by 111 over those reported in 1905, due chiefly to the large increase in the number of outbreaks of Lungsickness with a corresponding heavy mortality among stock.

Besides Lungsickness, which shows an increase of 368 outbreaks over that of the previous twelve months, the following diseases have increased in a minor degree, viz.: Anthrax by 21, Redwater by 6, Sponsziekte by 55, and Tuberculosis by 10 outbreaks. While Epizootic Lymphangitis by 6, Glanders by 21, Scabies by 21, and Swine Fever by 1, show decreases in the number of outbreaks reported to this Department.

It will also be noted that although the number of outbreaks of Anthrax reported have increased by nearly 50 per cent. the mortality among the affected herds shows a reduction of about 25 per cent.

Sponsziekte (Quarter Evil) was very prevalent in the East London, Herschel, King William's Town, Elliotdale, Kentani, Nqamakwe, and Willowvale districts, where heavy losses have been sustained.

It is gratifying to note (see Annexure 11) that both (1) the percentage of Deaths to the number of in-contact animals, and (2) the average number of Deaths per outbreak show a small decrease.

The numbers and value of Live-stock exported from this Colony over-sea show a very great decrease. This may be due to the export trade to German South West Africa having now practically ceased.

Live-stock imported into this Colony from over-sea likewise show a decrease of about 50 per cent.

Annexure (14) shows concisely the extent to which the various Scheduled Diseases are prevalent in each Division of the Colony, and as the figures for 1905 are reproduced, the rise and decline of each disease can be easily traced.

(1) Showing General Summary of number of outbreaks of Animals' Diseases scheduled under Act No. 27 of 1893.

(2) *Anthrax.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) Inoculated with Vaccine, and (*c*) died or destroyed.

(3) *Epizootic Lymphangitis.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Stud, (*b*) died or destroyed.

(4) *Glanders.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Stud, (*b*) tested with Mallein, and (*c*) died or destroyed.

(5) *Lungsickness.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) inoculated with Virus, and (*c*) died or destroyed.

(6) *Redwater.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) inoculated with Vaccine, and (*c*) died or destroyed.

(7) *Scabies* (Equine).—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Stud, and (*b*) died or destroyed.

(8) *Sponsziekte.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) inoculated with Vaccine, and (*c*) died or destroyed.

(9) *Swine Fever.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) died or destroyed.

(10) *Tuberculosis.*—Return showing number of outbreaks; the Divisions in which they occurred; also number of animals (*a*) in Herd, (*b*) tested with Tuberculin, and (*c*) died or destroyed.

(11) Return showing total number of animals affected in all animal diseases scheduled under Act No. 27 of 1893, also the percentage of deaths of those quarantined, and the average number of deaths per outbreak.

(12) Return showing the Quantity and Value of Live-stock exported oversea from Cape Colony.

(13) Return showing the numbers of Live-stock imported into the Cape Colony from oversea.

(14) Return showing numbers of the respective outbreaks of animal diseases scheduled under Act No. 27 of 1893 in the various Districts of the Cape Colony.

RESEARCH.

The only organised research work being conducted is that now being made by Veterinary Surgeon Spreull upon the disease "Lamziekte" amongst cattle, the experiments are being conducted at Koopmansfontein, in the Barkly West district, a farm credited with being most unhealthy for cattle in the way of "Lamziekte." The experiments though promising are not yet sufficiently advanced to admit of his reporting on the results obtained.

Veterinary Surgeon Elley has also been investigating disease amongst Ostriches at Oudtshoorn, but as the farmers have not come forward as liberally with diseased birds as they were expected to do, the results have not been so fruitful as they might have been; however, Veterinary Surgeon Elley has been able to do some useful work in that direction, as will be seen from his report herein.

LUNGSICKNESS.

This disease still carries off a large number of cattle yearly, but as an Amending Act has been passed compelling the destruction under partial compensation of all infected animals, it is hoped that when this Act is promulgated an advance will be made in the eradication of this disease. A very large number of inoculations have been made, more especially in the Transkeian Territories, where the disease is very prevalent. Regarding the chances of introducing the disease into a clean herd by means of inoculation, that is so remote that it should not be allowed to stand in the way of preventive inoculation. On this question Veterinary Surgeon Kearney says:—

"I have not myself seen an instance in which the disease developed in a healthy herd as a result of inoculation, and I suppose I must have done over 40 such clean herds."

And Veterinary Surgeon Dixon reports favourably on the prepared virus:—

"It is a pleasure to have to report favourably on the Lungsickness Virus that is being prepared at the Veterinary Laboratory, Grahamstown. I have inoculated a few thousand head of cattle with this virus, and the results have been most excellent. I have had very few bad swellings or gangrenous tails. Providing it is used within a month of its preparation, I find it is effectual, but I prefer if possible not to use it after fifteen days old."

Next year I trust to be able to submit a satisfactory report as to the progress made in the eradication of this disease.

ANTHRAX.

This disease still causes severe losses in Bechuanaland, Griqualand West, and in some of the Frontier districts, but fortunately as the value of Protective Inoculation is being more appreciated and adopted, it is hoped to considerably reduce the number of deaths from this disease. On this subject Veterinary Surgeon Dixon states:—

"I still have good results by inoculating with the increased doses of Pasteur's Vaccine, but I find it must be repeated regularly every year to be effectual. On one farm in the East London district, notoriously bad Anthrax veld, just about twelve months after inoculation, three oxen contracted Anthrax; immediately the whole herd was re-inoculated, and there were no more cases."

By increased doses, Mr. Dixon means increased doses for heavy oxen and bulls, as against ordinary breeding cattle.

Veterinary Surgeon Hutchence says:—

"This disease broke out in the Umzimkulu district in February on two farms, following the use of a sample of bone meal. On one farm I inoculated 160 cattle and 48 sheep, on the other farm 80 cattle. The loss was about 20 cattle, four calves, and 35 sheep before the inoculation."

Veterinary Surgeon Kearney says:—

"Regarding the inoculation against Anthrax, I put this in practice about a year ago on the station where during the previous year three or four deaths in cattle and one in a horse had occurred, and I am glad to say that the owner has not had one case since, and is about to re-inoculate. On one other farm where they lost six cattle and one horse last year, I have also recently inoculated, and I await with interest the result of the experiment, as the farm is, in my opinion, a highly infected one, and could only go on getting worse."

QUARTER EVIL, OR SPONSZIEKTE.

Owners of stock who lose cattle from this disease have mostly themselves to blame, as the results of protective inoculation have proved so successful, and the operation one which can be so easily performed. Instead of inoculating all the calves when they become of a sufficient age, the farmer frequently neglects to inoculate until a death occurs, when more deaths follow before vaccine can be obtained.

From my experience of the inoculation since 1890, I feel confident that "Quarter Evil" can be practically stamped out by early inoculations.

As regards the operation, the instructions issued by the makers of the vaccine state that the operation is to be performed in the tail, but the Veterinary Staff find that it is quite safe to inoculate in the dewlap, the operation being then made much simpler.

Veterinary Surgeon Dixon says:—

"Farmers who continue to inoculate their calves as they come on every season have succeeded practically in stamping out this disease."

Veterinary Surgeon Kearney says:—

"In the case of Sponsziekte, one native owner living in a low-lying part, lost ten beasts of ages varying from six months to three years before I was able to carry out preventive inoculation for him. An interesting fact in connection with this outbreak was that a European trader living in the same part, but who had inoculated his cattle some months previously, suffered no loss.

"It is also an interesting fact in connection with Sponsziekte, that the disease in these parts is by no means confined to calves, and this has a practical bearing in connection with the inoculation. I always inoculate the whole herd, though possibly ancient cattle might be excluded without danger, but I have myself seen the disease in cattle three years old."

Veterinary Surgeon Hutchence says:—

"I have this year inoculated 304 calves as a preventive against Blackquarter. In only one instance disease existed necessitating the inoculation. In other cases the farms had had Blackquarter in previous seasons. No deaths from this cause have occurred this year. Two last year, both three days after first inoculation."

REDWATER.

PROTECTIVE INOCULATION.

Veterinary Surgeons Dixon, Spreull, and Robinson report as follows:—

Dixon.—"I have again this winter and spring had the opportunity of inoculating susceptible cattle, both Colonial-bred and imported, with immune blood as a preventive against Redwater, and the results almost confirm my experience of last season. I found that great care has to be taken with imported stock in passing them through their inoculations.

"Colonial-bred cattle are very much less susceptible to Redwater inoculation than imported. Blood that will only give slight reactions to Colonial cattle will produce fatal attacks of the disease in imported cattle. In my last Annual Report I recommended for inoculation of imported cattle using blood of a calf about three months old for first inoculation and the blood of an older calf for the second.

"At the Coast here where Redwater is very virulent, I find that even the blood of some calves three months old is too virulent for imported cattle, and I have since employed the blood of calves from about a month to six weeks' old, and which have not been allowed to be exposed to tick infection as far as is possible here.

"I have only inoculated a few imported cattle with this blood, but up to the present the results are more satisfactory.

"If the reactions from the first blood are only mild, then I repeat with blood from an older calf but not sooner than sixty days after first.

"With valuable imported cattle it is better to keep them away from veld infection until at least three months after inoculation, as I have known cases where inoculated cattle allowed to be exposed to veld infection five weeks afterwards, contract a fatal attack of Redwater on the veld, it being supposed that they had ceased reacting to their blood inoculation."

Spreull.—At Grahamstown cases of Redwater kept cropping up from time to time even in midwinter. Most of these outbreaks were amongst privately owned milch cows in the town itself, and consequently there were very few cattle in close contact and these mostly already salted. The history of these outbreaks was nearly always the same, the sick cow had been bought in the district from some farm north of Grahamstown, and after about a month's grazing on the commonage, contracted the disease. These cases seemed to be almost uniformly fatal, even those contracted during the winter months proving no exception, and it is surprising how the public, with the Veterinary Laboratory so close at hand, should not resort to inoculation immediately upon the arrival of such an animal, for everyone seemed well aware that their Commonage is a Redwater infected area. The public becomes educated very slowly in such matters and pays heavily for its apathy or distrust, which is inexcusable now that the Laboratory is in the hands of a skilled Veterinarian.

Robinson.—Redwater, having reached the edge of the grass veld, spreads much more slowly than in the badly infested tick areas, and has, therefore, not during the past year spread with the same certainty or rapidity as it had previously done; from the time of its first appearance in Knysna in 1898, its extension was most persistent and regular, from 20 to 30 miles per year becoming an area in which an unsalted animal could not live; the whole of the districts of George and Knysna and the greater part of Humansdorp are now thoroughly Redwater infected areas, but in Mossel Bay the conditions are somewhat different. The Eastern side of that district extending northward towards the Outeniqua Mountain range is Redwater infected throughout, but in the more westerly portion extending to the Gouritz River the veld is of a different character, low bush with patches of grass predominating. In this area the extension of Redwater has been very erratic, and when introduced it seems to have very little tendency to spread even under wet climatic conditions. This is very unfortunate from a preventive point of view, as the uncertainty of its appearance makes owners of cattle less willing to take the small risk of inoculation, with the results that deaths of a few animals are of frequent occurrence, and owing to the continual movement of cattle from one part of the district to another, this must continue till all the cattle East of the Gouritz River, which is the quarantine line, become immune.

I have during the past year personally inoculated 1,800 cattle in the districts of Mossel Bay and Oudtshoorn, in addition to which several hundreds have been inoculated by others. In connection with this subject I must express my indebtedness to Mr. W. Allan, now Secretary to the Oudtshoorn Farmers' Association, for the very valuable assistance I have at all times received from him in dealing with Redwater in the Oudtshoorn district, and to Mr. J. Duthie, of Knysna, who during the past two seasons has conducted Redwater inoculation in the Long Kloof, Uniondale, with results which have given satisfaction to everyone concerned. In April last I visited the Veterinary Laboratory, Grahamstown, to see the method of preserving salted Redwater blood in use there. This method, which is tapping blood under aseptic conditions, is a very excellent one where arrangements are in existence for keeping cattle to be bled, and the necessary apparatus in convenient proximity, but as in Mossel Bay it would have required some small expenditure, for which no adequate return would have been received, I decided to keep on with the method I have used for the last six years, and which is fully described in my paper on Redwater inoculation in the "Agricultural Journal" for September, 1905. This method, under which the blood must be taken on the day it is used, is sometimes inconvenient when a few cattle have to be inoculated at different centres, but as it has been my object in dealing with this disease to teach owners to inoculate their own cattle when possible, I have thought it best to adhere to it, as there are young cattle available in nearly every part of the Redwater area, from which blood can be taken when required.

The early summer months for the last two years have been wet and cold, and consequently ticks have been somewhat late in making their appearance, and have remained longer than usual into the beginning of winter; this is a disadvantage to cattle, as at that time of the year the veld is deteriorating in condition, and when they are badly tick infested at that time, many of the cattle become so poor that they are unable to survive the cold season.

GLANDERS.

It is satisfactory to report that outbreaks of this disease are gradually diminishing, and I trust that under the provisions of the New Amended Animal Diseases Act to come into operation shortly a still more satisfactory state of affairs will be reported at the end of next year.

Veterinary Surgeon Spreull states:—

"Only one case of Glanders came under my notice during the year. As the symptoms displayed by this animal did not absolutely convince the owner, and the Mallein re-action was little marked, as it not infrequently is in horses clinically affected, I had the animal quarantined for a month, when the diagnostic picture being complete, he was destroyed. Numerous suspects came under my notice from time to time, and these were duly submitted to the Mallein test, but all were found free from Glanders."

Veterinary Surgeon Dixon says:—

"During the year I had six different outbreaks at King William's Town, four at East London, and one in the Cathcart district."

Veterinary Surgeon Pakeman says that:—

"These Glanders cases have usually been detected in stables where few others have been in contact, and were recent purchases of roving dealers."

Veterinary Surgeon Goodall also says:—

"Whilst on the subject of Glanders, I would like to say that nearly every case which comes under my notice in these districts is traceable, directly or indirectly, to animals brought in from other parts, chiefly Cape Town, by speculators, who are here to-day and gone to-morrow."

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EPIZOOTIC LYMPHANGITIS.

As in the case of Glanders, this disease is fast disappearing from the Colony, which is very gratifying considering how widespread it was three years ago.

Veterinary Surgeon Goodall states:—

"Epizootic Lymphangitis has now practically disappeared; this I consider astonishing, when one bears in mind the great vitality of the organism, and the trouble it has caused in other parts of the world. There was every indication of the disease becoming a scourge in the Worcester district just after the War, but the outbreaks became gradually fewer in number, and this year I have only had one brought to my notice.

Veterinary Surgeon Dixon says:—

"I had only two outbreaks of Epizootic Lymphangitis, two horses becoming affected. These were treated medicinally with Biniodide of Mercury, dose ten grains twice daily given internally, and both completely recovered."

Veterinary Surgeon Goundry remarks:—

"Two cases of Epizootic Lymphangitis have come under my notice. If not far advanced those put under treatment made good recovery. The treatment used was incision of nodules, and then dressing with strong disinfectant solution, Pure Carbolic Acid in preference. In this disease I have always laid particular stress on the necessity of strict Disinfection of Stables and of any Implements, Brushes, etc., in fact everything which has been in contact with affected animal. This disease appears, however, to be rather less prevalent than it was during the period just following the late War out here in South Africa. This gratifying result is mainly due to the vigorous steps taken by this Department to stamp it out."

Veterinary Surgeon Paine reports:—

"The number of outbreaks of Epizootic Lymphangitis has also decreased, save for cases occurring in the German Remount Station at Klapmuts; only one fresh outbreak occurred, namely, in the Clanwilliam district, and there has been no further extension of this outbreak."

STOMACH STAGGERS AND CIRRHOSIS OF LIVER.

Veterinary Surgeon Dixon reports:—

"Stomach Staggers and Cirrhosis of Liver is the cause of great loss amongst horses all through my area (East London). Horse breeding is practically impossible owing to this disease, as mares, after grazing two or more years on the sour veld, usually contract this affection and die. I have no doubt the cause is due to some plant or plants which are eaten, and which produce these actions slowly. The *Senecio Latifolius*, a plant which has been experimentally proved to kill horses shewing symptoms similar to those of Stomach Staggers, grows profusely all over my area. As regards treatment, I find, if taken early, much good can be done by medicinal treatment. I recommend first giving a purgative of Calomel, 2 drachms; and raw Linseed Oil, 1½ pints; turpentine, 2 ounces; followed by four balls each containing 6 grains of Arsenic and one drachm of Nux Vomica. One ball to be given morning and evening."

GEEL-DIKKOP IN SHEEP.

An attempt was made to start further investigations regarding this disease, but unfortunately circumstances were not favourable.

Veterinary Surgeon Elley, however, reports upon that disease as follows:—

"The past year has thrown discredit upon the old idea that when the veld is good Dikkop does not appear.

"Throughout the Beaufort West district the veld has seldom been better than in the early months of 1906, and yet Dikkop was very prevalent in January and February.

"Having been instructed by the Chief Veterinary Surgeon to wire immediately upon the disease appearing upon a farm suitably situated for experimental work being carried out, I did so on the 20th January, Dikkop having made its appearance on Mr. de Jager's farm Kuilspoort.

"Mr. Robertson arrived on the 23rd.

"The first experiments were conducted with the idea of proving whether or not the disease was capable of being produced by inoculation.

"Twelve clean sheep were brought up from the Peninsula, where the disease has never been known to occur, in order that there should be no danger of the experimental animals possessing any hereditary or acquired immunity.

"Inoculations were made from the blood, serum and exudate taken from marked cases, but in no case did any rise of temperature or other febrile symptom appear.

"Large numbers of blood smears and sections were examined without any trace of a parasite being discovered.

"The next experiments were carried out in the hope of proving whether the disease is due to any bush or other substance picked up on the veld, the theory which has most favour amongst farmers. Seventy sheep were sent up from the Institute at Grahamstown, and whenever Dikkop appeared in the vicinity the experimental sheep were despatched there.

"Forty were allowed to graze on the veld; the remaining thirty were securely muzzled whilst on the veld, being hand-fed and watered in improvised kraals.

"Although every effort was made to cause the experimental sheep to contract the disease, I regret that not one, either muzzled or unmuzzled, did so.

"I may point out that the erratic nature of Geel-Dikkop renders work of this sort very disappointing. A flock of one thousand sheep may have two or three hundred of its number affected in the course of a week, when it will suddenly cease, and possibly for a month there will not be another case.

"Thus the disease was very prevalent between the 5th and 9th of February on part of Kuilspoort veld, hired by Mr. Hugo. Kraals were made, forage, etc., sent out, and the experimental sheep arrived on the 11th, and remained until the 20th, on the exact veld upon which Mr. Hugo's sheep had been contracting the disease between the 5th and 9th. Next they were moved to veld a few miles distant, where the disease had appeared amongst another flock. On the 4th March I received word that about three hundred sheep amongst two flocks on the farm Grootfontein had contracted the disease. The veld was about twenty miles distant. However, on the 6th idem, my sheep arrived on that veld, remaining there until the 27th, yet not one contracted Dikkop. When work of this nature is again undertaken, I would strongly advise that the experimenter be provided with a much larger number of sheep, even if they are only borrowed, compensation being paid for losses, as it would almost appear as if a small quantity does not contract the disease, even in proportion to its numbers, as readily as a large flock.

"As a result of the experiments, and from careful observations, I draw the following conclusions:—

"(1) That Geel-Dikkop is neither infectious nor contagious.

"(2) That it is not directly inoculable.

"(3) That the liver lesions are secondary, the primary lesions assuming more the nature of malignant oedema.

"(4) That its occurrence is influenced by local elevation, though not by general altitude."

DISEASE IN PIGS.

Parasitic Pneumonia in pigs is more common than is generally believed to be the case. In one lot of forty which I saw destroyed, half of them were found to be affected, and as Veterinary Surgeon Paine points out, owners will not take proper steps to stamp out the pest.

He also states that "Parasitic Pneumonia in Pigs has been very prevalent, involving heavy losses on some of the farms, and it appears practically impossible to eradicate it unless the general system in force in the Colony of rearing pigs is changed. Many of the farms are badly infested with these parasites, and also with the 'Taenia Solium' (Tapeworm of man). The pigs run wild all over the farms, picking up all kinds of refuse, and even human excreta. In a few cases the owner has acted upon my advice by destroying the visibly affected pigs, constructing new styes, and keeping the pigs in them under strict supervision, but in the majority of cases no thorough steps have been taken to stamp out the pest."

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OSTRICH DISEASES.

Veterinary Surgeon Elley was entrusted with the experiments upon ostriches conducted at Oudtshoorn. It is hoped, however, that the ostrich farmers will extend a more liberal co-operation to our Officer, without which very little practical work can be accomplished.

Upon his experiments he reports as follows:—

"Probably the most important sickness amongst birds in the Oudtshoorn district is that known by the Dutch name of 'Vrot-maag.' I say most important, although it is probable that Liver-sickness carries off as great a number of birds, but in the case of the former trouble the owner has had the expense and worry of bringing up his birds until they are seven, eight or nine months, or perhaps older, when they will commence to die off.

"I believe this disease to be due to the presence of great numbers of minute hair-like worms, not in the stomach cavity alone, but occupying the lumens of the gastric glands.

"When the glands become invaded by these parasites, their action is very considerably modified or actually destroyed; the constant irritation leads to inflammation and pus formation, and in the place of the normal gastric juice, a mixture of gastric juice and pus, the latter steadily increasing as the former diminishes, is discharged into the stomach cavity.

"As the parasites increase digestion becomes more and more impaired, and muscular contraction of the stomach wells becomes lessened, and the bird, although provided with abundant food, literally dies from starvation, or from the assimilation of toxines produced in the diseased stomach. The other abnormalities to be found upon post-mortem examination are occasionally inflammation of the small bowel, and rarer, a clear exudate thrown out in the mucous-membrane of this part of the intestine; either or both of these conditions, which no doubt accelerate death in some cases, may reasonably be put down as a sequence to the state of the proventriculus or stomach.

"The stomach frequently contains an enormous mass of decomposing food, in no way crushed or prepared for digestion.

"If treatment is to be adopted it is quite evident that it must be in the early stages, and it must be systematically carried out. If the trouble is in any way far advanced, it is folly to suppose that one or two doses of any medicine whatsoever will procure a cure. The life history of the parasite is unknown. It is probable that the eggs or embryos pass out with the fæces, undergo certain changes in damp situations, and are then taken back with food or water in a fit state to complete the life cycle. After the embryos are swallowed it appears to me they find their way direct to the gastric glands, where pairing probably takes place. In a number of post-mortem examinations upon chicks, from two weeks to two months old, I have found small quantities of the parasites, from one up to eight, in the gastric glands, when none could be found adhering to the mucous-membrane of the stomach. The youngest bird which I have seen affected was twelve days old. It is quite evident then that birds become infected at a very early age, and if those farmers upon whose ground the trouble is rife wish to combat it, they must likewise begin to dose their birds at an early age, and they must recognise the fact that it is very little use to dose birds and immediately put them back into camps where diseased birds have for years been running.

"This is one of the greatest difficulties to be contended with in my area. The entire farms are divided into lucerne camps, all of which are occupied by birds, hence it is probable that the whole farm becomes more or less infected; moreover the regular irrigation must render the farms particularly suitable for that phase of the life history of the parasite spent in the open. Regarding drugs, probably the most efficacious are Thymol, Picrate of Potash, and Carbolic Acid, but it must be remembered that early and regular dosing is of more importance than the actual drug. I regret that more dosing, solely for experimental purposes, has not been carried out. The high value of local birds has no doubt made farmers indisposed to provide birds for the purpose, and owing to lack of funds I was unable to obtain authority to purchase any, and it must be borne in mind that a considerable number of birds are required for this work, as each bird should be killed for examination after receiving a dose of a known quantity and strength of the drug to be tried; for I do not consider it of any practical value to place portions of an affected stomach in certain solutions, as it cannot be supposed that in the recent state any inanimate matter enters the gastric glands otherwise than by the blood stream.

"I consider, if energetic steps were taken, a great deal might be done to modify the enormous losses occasioned annually by this disease.

"*Liver-sickness.*

"This disease is, I compute, responsible for about 85 per cent. of the deaths of birds under two months old in this district. Birds from a few days to six weeks or two months are alone susceptible, the majority succumbing at about three weeks. The fact that the symptoms appear so soon after the chick leaves the egg, that after six weeks they are usually safe, and that there is no alteration in food or general management at this time, all tend to point to some congenital debility which either overcomes the chick, or is itself overcome during the first month or six weeks outside the egg.

"Of the many theories suggested as the cause of this disease I am afraid none are tenable. Artificial incubation was a favourite one, yet I am informed that yellow liver was never more prevalent in the Oudtshoorn district than this season, and so far as I am aware there is not an artificial incubator working within my area.

"Scarce or irregular feeding of the parent bird is also stated to be a probable cause, whereas during the last two years food has been abundant.

"Housing, or the absence of it, for the chicks, so far as my experience goes, makes no difference, and I have seen them die off as readily when left with the parent as when removed.

"Blood smears and sections forwarded to Mr. Robertson, Director of the Veterinary Laboratory, Grahamstown, have revealed no parasites, and cultures which we have attempted to take from the livers of diseased birds, remained sterile, moreover, although endemic, it would scarcely appear infectious.

"As stated above, everything would appear to point to some congenital debility. Is it not possible that the extremely artificial life to which breeding birds are submitted has something to do with it? When one remembers the natural life of an ostrich, and then compares it with the life of the average pair of breeding birds, confined year after year upon a third or a quarter of a morgen of ground, fed entirely on lucerne, with insufficient grit, one would wonder rather at the absence of disease than at its presence. Whether or not this is the direct cause, I am convinced it is a predisposing one.

"An incident recently brought to my notice has strengthened me in this belief. The owner of one of the best farms in this district gave up attempting to raise chicks three years ago, as for several years previously all his chicks had succumbed. His breeding birds were turned out into the larger camp, and on to the veld. This season the attempt was made again, and in June four pairs of birds were camped off, the majority of these being his old breeding birds. He has now forty-three fine healthy young birds varying from one to four months' old, out of fifty chicks hatched. I have observed that yellow liver is more prevalent amongst the chicks of old breeding birds than amongst those of young ones, that it is more frequent on the farms of those who for years have held rigidly to their own stock, than on the farms of those who regularly bring in fresh birds, moreover I have never seen it amongst the hundreds of chicks which I have seen taken out of the nests of the Karoo veld, housed at nights under perhaps not too hygienic conditions, and fed entirely on lucerne for the first month or six weeks. And I may here mention that veld birds from which the chicks are taken as soon as hatched, which is the practice in the Beaufort district, will lay a considerably greater number of eggs in the twelve months than any camped breeding birds, so that the egg forcing theory will not hold good. Medicinal treatment appears of little avail, calomel, quinine, ammonia, and salol have alike been tried, and so far as our knowledge goes at present, I consider it is the management of the parent bird which must be looked to rather than treatment of the chicks.

"*Everted Cloacæ.*

"During the winter months quite a large number of chicks succumb to this troublesome complaint, which I believe to be due to an excess of phosphatic salts in the urine probably aggravated by a chill on the highly developed kidneys of the young birds. The salts become deposited on the lining of the cloaca at the termination of the ureteres. The irritation so produced leads to straining and diversion of the cloaca, expulsion of fæces and urine is interfered with, inflammation and gangrene follow, and death is the usual termination.

"The condition appears amenable to treatment, and a few doses of Nitric Acid, with a change of food where possible, a lubricant to the affected parts, and the housing of the chicks at night, and until the dew is off the lucerne in the morning, generally has satisfactory results, whereas, if not so treated, few recover.

"*Bars in Feathers.*

"Before any opinion is expressed upon this much disputed question, I consider it essential that the observer should have had the same birds under his care for at least eight or nine months. One crop of feathers should have been cut and notes taken, the quills pulled, and the following crop allowed to grow out before any theory is formed. I have at present five birds under observation in connection with bars. Their last crop of feathers was cut about September or October, the quills drawn one to two months later, and the new feathers are now coming out.

"Some birds are being kept entirely free from lice, and on others the lice are rather encouraged. Artificial barring is being tried on certain feathers, and the utmost regularity is observed regarding the feeding.

"Every few days the birds are carefully examined and notes taken. I hope, therefore, in the course of a few months to be able to make a statement founded upon more than mere hypothesis."

AFRICAN COAST FEVER.

Again it has been our good fortune to remain free for another year from invasion by this deadly and troublesome disease affecting cattle, though for some time threatened on our Bechuanaland Border and more recently from Natal, where in spite of the most strenuous efforts of the Veterinary Staff of that Colony the disease has spread rapidly during the Native disturbance, necessitating our imposing stringent measures to regulate the traffic in cattle between our Native Territories and Natal. On our Bechuanaland Border, though distinctly menaced at close quarters at one time, the excellent measures adopted by the Transvaal Executive soon relieved us of anxiety on this score, while great credit is due to the efficient manner in which the Police employed on special cordon duty have guarded the border line.

J. D. BORTHWICK,
Chief Veterinary Surgeon.

Veterinary Branch, Department of Agriculture,
Cape Town, 19th April, 1907.

STATISTICAL TABLES.

ANNEXURE (1).

General Summary showing Numbers of Outbreaks of Animal Diseases scheduled under Act No. 27 of 1893 during 1906, with comparative totals for 1905.

MONTH.	Anthrax.	Epizootic Lymphangitis.	Glanders.	Lung-sickness.	Redwater.	Scabies (equine).	Sponszieke.	Swine Fever.	Tuberculosis.	TOTAL.
January	8	1	12	31	16	...	3	...	1	72
February	5	2	6	26	48	1	18	...	3	109
March	9	...	8	24	29	...	23	1	1	95
April	5	...	7	31	11	...	9	...	2	65
May	5	...	5	47	21	2	12	...	1	93
June	5	2	6	58	4	4	12	...	3	94
July	2	...	9	64	4	...	7	...	...	86
August	3	...	9	61	3	1	5	...	...	82
September	2	2	5	46	...	...	6	...	1	62
October	5	...	7	63	3	1	9	...	...	88
November	14	...	4	55	8	6	17	...	...	104
December	3	2	10	49	8	...	12	...	1	85
1906	66	9	88	555	155	15	133	1	13	1,035
1905	45	15	109	187	149	36	78	2	3	624

ANNEXURE (2).

ANTHRAX.

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in Herd, (*b*) Inoculated with Vaccine, and (*c*) Died or Destroyed during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in Division.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated.	Died or Destroyed.	
Albany	...	...	1	...	...	...	...	...	...	...	...	...	50	...	1	1
Alexandria	...	...	1	...	...	...	...	...	...	...	...	...	100	96	4	1
Barkly East	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	1
Barkly West	...	1	...	...	...	...	...	...	...	...	...	...	200	...	1	2
	...	...	...	...	...	1	...	...	...	...	...	...	4	...	...	
Klipdam	...	...	...	...	...	...	...	...	...	2	...	...	4	...	...	2
Bathurst	...	...	...	...	1	...	...	...	...	...	...	...	36	...	21	1
Bedford	...	1	...	...	...	...	...	...	...	...	...	...	600	...	1	3
	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	
	...	...	...	...	...	...	...	...	...	...	1	...	3	...	3	
East London	...	...	...	...	...	...	1	...	...	...	...	...	16	1	1	4
	...	...	...	...	...	...	...	1	...	...	...	...	34	...	1	
	...	...	...	...	...	...	...	...	1	...	...	...	9	...	2	
	...	...	...	...	...	...	...	...	...	...	1	...	62	...	3	
Hay	2	...	...	...	...	...	...	...	...	...	...	...	2,015	15	12	2
Kimberley	1	...	...	...	...	...	...	...	...	...	...	...	75	...	2	5
	...	2	...	...	...	...	...	...	...	...	...	...	735	734	4	
	...	...	1	...	...	...	...	...	...	...	...	...	87	...	14	
	...	...	...	1	...	...	...	...		...	...	...	500	496	4	
King William's Town	1	...	...	...	...	...				...	...	...	486	...	13	2
	...	...	...	...	...	...				1	...	...	9	...	1	
Komgha	1	...	...	...	...	...				...	...	...	50	...	1	3
	...	...	...	...	1	...				...		...	130	...	1	
	...	...	...	...	...	...				...	1	...	14	...	2	
Mafeking	1	...	...	...	...	...				...		...	123	...	1	2
	...	...	...	...	...	...	...			...		...	30	...	3	
Peddie	...	...	...	...	...	...	...	...		...		...	1	...	1	1
Piquetberg	...	...	1	...	...	...	...	...		...		...	1	...	1	1
Prieska	...	...	1	...	...	...	...	...		...		...	120	...	7	1
Queenstown	...	...	...	...	1	...	...	...		...		...	150	...	6	1
Stutterheim	1	...	...	...	...	...	...	...	...	...		...	30	23	8	1
Taungs	...	...	...	...	1	...	...	...	...	...		...	2	...	2	5
	...	...	...	...	...	...	1	...	...	...		...	22	...	1	
	...	...	...	...	...	...	...	...	...	...	2	...	12	...	12	
	...	...	...	...	...	...	...	...	...	...		1	44	43	1	
Vryburg	...	...	...	...	...	...	...	...	...	...		...	8	...	3	1
Native Territories:																
Tembuland.																
Umtata	...	...	...	1	...	...	...	...	...			...	40	...	1	10
	...	...	...	...	...	...	...	1	...			...	12	...	1	
	...	...	...	...	...	...	...	...	1			...	4	...	1	
	...	...	...	...	...	...	...	...	...			...	30	...	1	
	...	...	...	...	...	...	...	...	...		5	...	69	...	5	
	...	...	...	...	...	...	...	...	...		...	1	10	...	1	
Transkei.																
Idutywa	...	...	...	...	...	...	...	...	...	1	...	...	5	...	1	1
Nqamakwe	...	...	3	...	...	...	...	...	...	...	...	...	141	...	3	7
	...	...	...	2	...	...	...	...	...	...	...	...	33	...	4	
	...	...	...	...	...	2	...	...	...	...	...	...	33	...	2	
Willowvale	1	...	...	...	...	...	...	...	...	...	...	...	41	...	3	4
	...	...	...	...	...	2	...	...	...	...	...	...	72	...	4	
	...	...	...	...	...	...	...	...	...	...	1	...	11	...	1	
Pondoland.																
Lusikisiki	...	...	...	...	...	...	...	...	...	...	...	1	4	...	1	1
Griqualand East.																
Tsolo	...	...	...	1	...	...	...	...	...	...	...	...	10	...	1	2
	...	...	...	...	1	...	...	...	...	...	...	...	14	...	1	
Umzimkulu	...	1	...	...	...	...	...	...	...	...	...	...	125	106	19	1
Totals for 1906	8	5	9	5	5	5	2	3	2	5	14	3	6,418	1,514	190	66
Totals for 1905	2	2	5	4	7	4	2	2	3	3	4	7	3,148	994	252	45

ANNEXURE (3).

Epizootic Lymphangitis.

Return showing Number of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in Stud, (*b*) Died or Destroyed during 1906, with comparative totals for 1905.

District.	Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	Total Number of Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In Stud.	Died or Destroyed.	
Cape	...	...	...	...	...	...	...	...	1	...	...	...	1	1	1
Clanwilliam ...	...	...	...	...	...	1	...	...	...	...	...	...	7	1	1
East London ...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	2
	...	...	...	...	...	1	...	...	...	...	...	...	1	1	
King William's Town	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1
Malmesbury ...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1
Somerset East ...	1	...	...	..	...	...	...	...	...	...	...	...	1	1	1
Worcester... ...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	1
Native Territories—Transkei.															
Butterworth ...	...	...	...	...	...	...	...	...	1	...	...	...	5	...	1
Totals for 1906	1	2	...	...	...	2	...	...	2	...	...	2	20	4	9
Totals for 1905	...	2	2	1	1	1	2	1	2	...	1	2	69	9	15

ANNEXURE (4).

GLANDERS.

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in Stud, (*b*) Tested with Mallein, and (*c*) Died or Destroyed during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In Stud.	Tested with Mallein.	Died or Destroyed.	
Albany	1	...	...	...	...	...	...	...	...	...	...	...	2	2	1	3
	...	...	...	...	...	...	...	...	...	1	...	...	2	...	2	
	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	
Albert	...	...	...	1	...	...	...	...	...	...	...	...	2	2	2	1
Aliwal North ...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	2
	...	...	...	...	...	1	...	...	...	...	...	...	1	1	1	
Barkly West	1	...	...	...	...	...	...	...	...	...	...	...	5	...	5	1
Klipdam	...	...	1	...	...	...	...	...	...	...	...	...	49	43	6	1
Caledon	...	...	1	...	...	...	...	...	...	...	...	...	14	13	1	2
	...	...	...	...	...	...	...	...	1	...	...	...	20	16	7	
Calvinia	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1
Cape	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	5
	...	...	...	...	...	...	2	...	...	...	...	...	13	1	6	
	...	...	...	...	...	...	...	...	...	1	...	...	4	3	1	
	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	
Durbanville	...	...	1	...	...	...	...	...	...	...	...	...	15	14	5	1
Cathcart	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	1
Ceres	1	...	...	...	...	...	...	...	...	...	...	...	4	3	1	2
	...	1	...	...	...	...	...	...	...	...	...	...	4	3	1	
Clanwilliam	...	...	1	...	...	...	...	...	...	...	...	...	11	...	4	1
Cradock	...	...	...	...	...	...	...	...	...	...	1	...	7	7	4	1
East London ...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	5
	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	
	...	...	...	...	...	1	...	...	...	...	...	...	6	5	5	
	...	...	...	...	...	...	2	...	...	...	...	...	11	5	2	
Humansdorp	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3
	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	
Kimberley	1	...	...	...	...	...	...	...	...	...	...	...	3	...	3	3
	...	...	...	...	...	...	1	...	...	...	...	...	2	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	4	4	1	
King William's Town	...	2	...	...	...	...	...	...	...	...	...	...	4	2	2	5
	...	...	1	...	...	...	...	...	...	...	...	...	10	10	3	
	...	...	...	1	...	...	...	...	...	...	...	...	6	5	1	
	...	...	...	...	...	...	1	...	...	...	...	...	2	...	1	
Knysna...	...	...	...	...	...	...	...	1	...	...	...	...	11	11	2	1
Malmesbury	...	...	...	...	...	...	...	2	...	...	...	...	15	14	3	3
	...	...	...	...	...	...	...	...	1	...	...	...	*	*	*	
Middelburg	...	...	...	...	...	...	...	1	...	...	...	...	3	2	1	1
Molteno	...	...	...	...	...	...	...	1	...	...	...	...	5	4	1	1
Montagu	...	...	...	...	1	...	...	...	...	...	...	...	2	2	1	2
	...	...	...	...	...	...	1	...	...	...	...	...	5	4	1	
Namaqualand	1	...	...	...	...	...	...	...	...	...	...	...	2	2	2	5
	...	...	...	2	...	...	...	...	...	...	...	...	8	3	3	
	...	...	...	...	2	...	...	...	...	...	...	...	5	...	5	
Oudtshoorn	...	...	...	...	...	1	...	...	...	...	...	...	4	...	2	2
	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	
Paarl	1	...	...	...	...	...	...	...	...	...	...	...	3	3	1	2
	...	...	1	...	...	...	...	...	...	...	...	...	23	21	6	
Peddie	...	...	...	1	...	...	...	...	...	...	...	...	4	3	1	1
Piquetberg	...	1	...	...	...	...	...	...	...	...	...	...	22	19	1	1
Port Elizabeth... ...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	2
	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	
Prieska	1	...	...	...	...	...	...	...	...	...	...	...	15	14	1	1
Richmond	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	1
Robertson	...	...	...	...	...	...	...	...	...	1	...	...	8	7	1	1
Simonstown	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	1
Stellenbosch	1	...	...	...	...	...	...	...	...	...	...	...	3	2	1	1
Uitenhage	...	...	...	...	...	1	...	...	...	...	...	...	2	...	2	3
	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	
Van Rhynsdorp	...	1	...	...	...	...	...	...	...	...	...	...	8	...	8	1
Willowmore	...	...	...	...	...	...	...	...	1	...	...	...	5	5	1	2
	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	

* No details available.

ANNEXURE (4)—*continued.*

GLANDERS.

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in Stud, (*b*) Tested with Mallein, and (*c*) Died or Destroyed during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In Stud.	Tested with Mallein.	Died or Destroyed.	
Worcester	...	...	...	...	...	...	...	...	...	...	2	...	4	2	2	2
Wynberg	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	3
	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	
	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	
Native Territories. *Tembuland.*																
Elliotdale	...	...	...	...	...	...	...	...	...	...	...	3	4	...	3	3
Umtata	...	...	...	1	...	...	...	...	...	...	...	...	150	150	1	4
	...	...	...	...	1	...	...	...	...	...	...	...	2	1	2	
	...	...	...	...	...	...	1	...	...	...	...	...	4	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	8	...	6	
Transkei.																
Butterworth	...	...	...	...	...	...	...	1	...	...	...	...	3	2	1	1
Idutywa	...	...	...	...	...	...	...	...	...	1	...	...	4	3	3	1
Pondoland.																
Bizana	...	...	...	...	...	1	...	...	...	...	...	...	60	59	2	1
Lusikisiki	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	1
Griqualand East.																
Matatiele	...	...	...	...	...	...	...	1	...	...	...	...	20	13	4	2
	...	...	...	...	...	...	...	...	...	...	...	1	8	4	6	
Totals for 1906	12	6	8	7	5	6	9	9	5	7	4	10	644	490	165	88
Totals for 1905	15	9	16	10	7	10	7	6	5	6	9	9	1,092	746	252	109

ANNEXURE (5).

LUNGSICKNESS.

Return showing Numbers of Outbreaks ; the Divisions in which they occurred ; also numbers of Animals (*a*) in herd, (*b*) inoculated with virus, (*c*) died or destroyed during 1906, and comparative totals for 1905.

DISTRICT.	Outbreaks 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total No. Outbreaks in Division.
	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In herd.	Inoculated with virus.	Died or destroyed.	
Albany	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2
	...	...	...	...	...	...	...	1	...	...	...	...	95	2	2	
Barkly East... ...	...	...	...	...	1	...	...	...	...	...	...	...	32	31	1	1
East London ...	7	...	...	...	...	...	...	...	...	...	...	...	273	2	4	86
	...	8	...	...	...	...	...	...	...	...	...	...	356	...	7	
	...	...	3	...	...	...	...	...	...	...	...	...	325	...	1	
	...	...	...	9	...	...	...	...	...	...	...	...	217	...	7	
	...	...	...	...	10	...	...	...	...	...	...	...	343	94	8	
	...	...	...	...	...	13	...	...	...	...	...	...	807	32	10	
	...	...	...	...	...	...	14	...	...	...	...	...	402	75	15	
	...	...	...	...	...	...	...	8	...	...	...	...	274	179	5	
	...	...	...	...	...	...	...	...	5	...	...	...	137	26	8	
	...	...	...	...	...	...	...	...	...	2	...	...	500	339	6	
	...	...	...	...	...	...	...	...	...	...	3	...	156	58	9	
	...	...	...	...	...	...	...	...	...	...	...	4	188	87	31	
Fort Beaufort ...	...	1	...	...	...	...	...	...	...	...	...	...	16	...	3	2
	...	...	1	...	...	...	...	...	...	...	...	...	79	...	3	
Glen Grey	...	1	...	...	...	...	...	...	...	...	...	...	o	o	o	1
‡Gordonia	1	...	...	...	...	...	...	...	...	...	...	...	30	...	1	39
	...	2	...	...	...	...	...	...	...	...	...	...	94	...	1	
	...	...	...	3	...	...	...	...	...	...	...	...	135	...	10	
	...	...	...	...	...	3	...	...	...	...	...	...	810	...	22	
	...	...	...	...	...	...	10	...	...	...	...	...	1335	157	13	
	...	...	...	...	...	...	...	3	...	...	...	...	126	...	4	
	...	...	...	...	...	...	...	...	4	...	...	...	267	146	6	
	...	...	...	...	...	...	...	...	...	7	...	...	1132	...	14	
	...	...	...	...	...	...	...	...	...	...	3	...	203	119	4	
	...	...	...	...	...	...	...	...	...	...	...	3	261	138	10	
Griqua Town ...	...	...	...	1	...	...	...	...	...	...	...	...	99	98	1	4
	...	...	...	...	...	...	2	...	...	...	...	...	36	35	3	
	...	...	...	...	...	...	...	...	...	1	...	...	30	...	2	
‡Kenhardt	2	...	...	...	...	...	...	...	...	...	...	...	170	...	4	8
	...	...	...	...	...	...	...	3	...	...	...	...	114	34	6	
	...	...	...	...	...	...	...	...	2	...	...	...	108	...	2	
	...	...	...	...	...	...	...	...	...	1	...	...	20	...	1	
King William's Town	4	...	...	...	...	...	...	...	...	...	...	...	85	...	6	45
	...	2	...	...	...	...	...	...	...	...	...	...	69	...	4	
	...	...	3	...	...	...	...	...	...	...	...	...	79	...	3	
	...	...	...	1	...	...	...	...	...	...	...	...	73	...	1	
	...	...	...	...	6	...	...	...	...	...	...	...	135	...	5	
	...	...	...	...	...	2	...	...	...	...	...	...	195	134	3	
	...	...	...	...	...	...	8	...	...	...	...	...	533	59	9	
	...	...	...	...	...	...	...	1	...	...	...	...	36	...	1	
	...	...	...	...	...	...	...	...	4	...	...	...	131	...	9	
	...	...	...	...	...	...	...	...	...	4	...	...	132	75	8	
	...	...	...	...	...	...	...	...	...	...	6	...	165	54	11	
	...	...	...	...	...	...	...	...	...	...	...	4	201	150	8	
Komgha	4	...	...	...	...	...	...	...	...	...	...	...	263	...	2	68
	...	1	...	...	...	...	...	...	...	...	...	...	40	...	1	
	...	...	4	...	...	...	...	...	...	...	...	...	108	55	8	
	...	...	...	3	...	...	...	...	...	...	...	...	258	15	4	
	...	...	...	...	11	...	...	...	...	...	...	...	1186	19	74	
	...	...	...	...	...	11	...	...	...	...	...	...	719	301	45	
	...	...	...	...	...	...	4	...	...	...	...	...	241	...	5	
	...	...	...	...	...	...	...	11	...	...	...	...	590	17	17	
	...	...	...	...	...	...	...	...	6	...	...	...	238	99	18	
	...	...	...	...	...	...	...	...	...	3	...	...	65	...	5	
	...	...	...	...	...	...	...	...	...	...	7	...	420	199	9	
	...	...	...	...	...	...	...	...	...	...	...	3	81	...	4	

ANNEXURE (5).

LUNGSICKNESS—*contd.*

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also numbers of Animals (*a*) in herd, (*b*) inoculated with virus, (*c*) died or destroyed during 1906, and comparative totals for 1905.

DISTRICT.	Outbreaks 1906.												Number of Animals.			Total No. Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	(*a*) In herd.	(*b*) Inoculated with virus.	(*c*) Died or destroyed.	
Kuruman	...	...	...	...	...	...	2	...	...	...	...	...	207	...	4	7
	...	...	...	...	...	...	...	...	2	...	...	...	118	...	9	
	...	...	...	...	...	...	...	...	...	...	1	...	14	12	2	
	...	...	...	...	...	...	...	...	...	...	...	2	75	...	2	
Mafeking	...	...	...	...	...	...	...	...	1	...	...	...	81	...	12	1
Namaqualand ...	...	...	...	...	†2	...	...	...	...	...	...	...	55	55	18	4
	...	...	...	...	...	...	...	1	...	...	...	...	54	...	2	
	...	...	...	...	...	...	...	...	1	...	...	...	77	76	25	
Peddie	...	...	...	...	..	2	...	...	...	...	...	...	138	...	1	24
	...	...	...	...	...	...	4	...	...	...	...	...	226	16	4	
	...	...	...	.	...	...	...	6	...	...	...	...	281	...	4	
	...	...	...	...	...	...	...	...	1	...	...	...	40	...	1	
	..	...	...	...	...	...	...	...	...	5	...	...	100	9	2	
	...	...	...	...	...	...	...	...	...	...	2	...	82	41	63	
	...	...	...	...	...	...	...	...	...	...	...	4	189	150	4	
Prieska	...	...	...	...	...	1	...	...	...	...	...	...	8	...	1	1
Stockenstrom ...	...	...	1	...	...	...	...	...	...	...	...	...	70	...	1	2
	...	...	...	...	1	...	...	...	...	...	...	.	34	...	1	
Stutterheim	...	...	...	1	...	...	...	...	...	...	...	...	350	...	...	5
	...	...	...	...	...	...	...	1	...	...	...	...	52	...	...	
	...	...	...	...	...	...	...	...	...	3	...	...	122	33	4	
Swellendam	...	...	...	...	...	...	...	1	...	...	...	...	145	13	...	1
Taungs	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	1
Victoria East ...	...	1	...	...	...	...	...	...	...	...	...	...	11	...	1	8
	...	...	...	2	...	...	...	...	...	...	...	...	12	7	2	
	...	...	...	...	...	1	...	...	...	...	.	...	12	12	3	
	...	...	...	...	...	...	1	...	...	...	...	...	9	...	4	
	...	...	...	...	...	...	...	...	...	3	...	...	60	...	3	
Vryburg	1	...	...	...	...	...	...	...	...	...	...	...	30	...	1	8
	...	2	...	...	...	...	...	...	...	...	...	...	40	...	1	
	...	...	1	...	...	...	...	...	...	...	...	...	4	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	50	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	10	...	1	
	...	...	...	...	...	...	...	...	...	...	1	...	88	...	1	
	...	...	...	...	...	...	...	...	...	...	...	1	48	...	2	
Native Territories: Tembuland.																
Elliotdale	...	...	...	...	...	...	...	...	...	2	...	...	17	...	4	2
Engcobo	...	...	...	4	...	...	...	...	...	...	...	...	129	...	1	7
	...	...	...	...	2	...	...	...	...	...	...	...	32	...	...	
	...	...	...	...	...	...	...	...	...	...	1	...	39	38	1	
Mqanduli	...	...	...	...	...	...	1	...	...	...	...	...	7	...	1	4
	...	...	...	...	...	...	...	1	...	...	...	...	58	57	1	
	...	...	...	...	...	...	...	...	1	...	...	...	45	...	2	
	...	...	...	...	...	...	...	...	...	...	...	1	232	231	1	
St. Marks	...	...	1	...	...	...	...	...	...	...	...	...	40	...	2	1
Umtata	...	...	...	...	...	1	...	...	...	...	...	...	40	...	1	18
	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	
	...	...	...	...	...	...	...	...	1	...	...	...	11	...	1	
	...	...	...	...	...	...	...	...	...	2	...	...	85	...	5	
	...	...	...	...	...	...	...	...	...	...	9	...	408	128	29	
	...	...	...	...	...	...	...	...	...	...	...	4	89	...	5	
Cala	...	1	...	...	...	...	...	...	...	...	...	...	34	...	2	1
Transkei.																
Butterworth ...	...	1	...	...	...	...	...	...	...	...	...	...	16	...	1	22
	...	...	...	...	...	7	...	...	...	...	...	...	217	11	10	
	...	...	...	...	...	...	4	...	...	...	...	...	142	...	2	
	...	...	...	...	...	...	...	3	...	...	...	...	73	25	8	
	...	...	...	...	...	...	...	...	...	2	...	...	70	...	15	
	...	...	...	...	...	...	...	...	...	...	3	...	72	32	10	
	...	...	...	...	...	...	...	...	...	...	...	2	52	32	2	

ANNEXURE (5).

LUNGSICKNESS—*contd.*

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also numbers of Animals (*a*) in herd, (*b*) inoculated with virus, (*c*) died or destroyed during 1906, and comparative totals for 1905.

DISTRICT.	Outbreaks 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total No. Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In herd.	Inoculated with virus.	Died or destroyed.	
Transkei—contd.																
Kentani	1	...	...	...	...	...	...	...	...	...	...	...	11	...	2	47
	...	1	...	...	...	...	...	...	...	...	...	...	13	...	1	
	...	...	1	...	...	...	...	...	...	...	...	...	55	55	1	
	...	...	...	1	...	...	...	...	...	...	...	...	93	...	2	
	...	...	...	...	4	...	...	...	...	...	...	...	76	...	7	
	...	...	...	...	...	9	...	...	...	...	...	...	422	...	9	
	...	...	...	...	...	...	3	...	...	...	...	...	59	14	5	
	...	...	...	...	...	...	...	5	...	...	...	...	88	...	13	
	...	...	...	...	...	...	...	...	4	...	...	...	129	...	9	
	...	...	...	...	...		...	...	...	6	...	...	110	...	7	
	...	...	...	...	...	...	...	...	...	...	6	...	101	...	8	
	...	...	...	...	...	...	...	...	...	...	...	6	76	...	7	
Nqamakwe	5	...	...	...	...	...	...	...	...	...	...	...	146	...	1	35
	...	1	...	...	...	...	...	...	...	...	...	...	26	...	1	
	...	...	2	...	...	...	...	...	...	...	...	...	45	...	1	
	...	...	...	5	...	...	...	...	...	...	...	...	146	...	5	
	...	...	...	...	3	...	...	...	...	...	...	...	192	...	3	
	...	...	...	...	...	1	...	...	...	...	...	...	40	...	1	
	...	...	...	...	...	...	1	...	...	...	...	...	37	...	1	
	...	...	...	...	...	...	...	2	...	...	...	...	43	...	2	
	...	...	...	...	...	...	...	...	5	...	...	...	163	...	7	
	...	...	...	...	...	...	...	...	...	4	...	...	156	...	5	
	...	...	...	...	...	...	...	...	...	...	3	...	115	...	3	
	...	...	...	...	...	...	...	...	...	...	...	3	82	...	2	
Tsomo	...	...	...	...	...	...	5	...	...	...	...	...	198	...	3	11
	...	...	...	...	...	...	...	2	...	...	...	...	242	...	2	
	...	...	...	...	...	...	...	...	1	...	...	...	34	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	108	...	1	
	...	...	...	...	...	...	...	...	...	...	1	...	48	47	1	
	...	...	...	...	...	...	...	...	...	...	...	1	9	...	1	
Willowvale	3	...	...	...	...	...	...	...	...	...	...	...	184	48	4	13
	...	1	...	...	...	...	...	...	...	...	...	...	34	...	1	
	...	...	...	...	1	...	...	...	...	...	...	...	21	...	...	
	...	...	...	...	...	...	...	...	2	...	...	...	75	4	4	
	...	...	...	...	...	...	...	...	...	2	...	...	17	...	1	
	...	...	...	...	...	...	...	...	...	...	2	...	189	...	3	
	...	...	...	...	...	...	...	...	...	...	...	2	31	28	3	
Pondoland.																
Bizana	...	...	...	...	...	...	...	...	...	1	...	...	42	...	17	1
Flagstaff	1	...	...	...	...	...	...	...	...	...	...	...	188	188	31	2
	...	1	...	...	...	...	...	...	...	...	...	...	98	...	5	
Libode	...	...	...	...	...	...	...	1	...	...	...	...	20	18	2	2
	...	...	...	...	...	...	...	...	...	1	...	...	6	5	1	
Lusikisiki	...	...	...	...	1	...	...	...	...	...	...	...	45	45	1	8
	...	...	...	...	...	1	...	...	...	...	...	...	14	...	1	
	...	...	...	...	...	...	...	2	...	...	...	...	36	15	4	
	...	...	...	...	...	...	...	...	...	1	...	...	51	50	29	
	...	...	...	...	...	...	...	...	...	...	1	...	22	21	1	
	...	...	...	...	...	...	...	...	...	...	...	2	64	21	2	
Ngqeleni	...	...	...	...	...	...	...	...	1	...	...	...	5	...	1	1
Tabankulu	1	...	...	...	...	...	...	...	...	...	...	...	35	...	1	5
	...	...	1	...	...	...	...	...	...	...	...	...	44	...	1	
	...	...	...	...	2	...	...	...	...	...	...	...	135	45	1	
	...	...	...	...	...	...	...	...	...	...	...	1	94	93	1	

ANNEXURE (5)

Lungsickness—*contd.*

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also numbers of Animals (*a*) in herd, (*b*) inoculated with virus, (*c*) died or destroyed during 1906, and comparative totals for 1905.

District.	Outbreaks 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total No. Outbreaks in Division.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In herd.	Inoculated with virus.	Died or destroyed.	
Griqualand East.																
Kokstad	...	...	...	...	...	...	...	...	1	...	...	...	212	...	2	1
Maclear	...	...	1	...	...	...	...	...	...	...	...	...	9	...	1	2
	...	...	...	...	...	1	...	...	...	...	...	...	127	...	1	
Matatiele	...	1	...	...	...	...	...	...	...	...	...	...	30	...	...	2
	...	...	1	...	...	...	...	...	...	...	...	...	48	...	1	
Mount Ayliff ...	...	...	...	...	...	...	...	1	...	...	...	...	69	66	19	5
	...	...	...	...	...	...	...	...	1	...	...	...	41	40	4	
	...	...	...	...	...	...	...	...	...	...	1	...	28	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	86	45	4	
Mount Fletcher ...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	1
Mount Frere ...	...	...	1	...	...	...	...	...	...	...	...	...	15	...	1	14
	...	...	...	...	2	...	...	...	...	...	...	...	72	...	17	
	...	...	...	...	...	3	...	...	...	...	...	...	88	...	2	
	...	...	...	...	...	...	...	2	...	...	...	...	89	53	2	
	...	...	...	...	...	...	...	...	1	...	...	...	58	...	1	
	...	...	...	...	...	...	...	...	...	3	...	...	101	16	6	
	...	...	...	...	...	...	...	...	...	...	1	...	78	75	3	
	...	...	...	...	...	...	...	...	...	...	...	1	30	29	2	
Qumbu	...	...	1	...	...	...	...	...	...	...	...	...	50	...	4	14
	...	...	...	...	1	...	...	...	...	...	...	...	50	...	1	
	...	...	...	...	...	...	1	...	...	...	...	...	92	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	24	22	7	
	...	...	...	...	...	...	...	...	2	...	...	...	29	...	3	
	...	...	...	...	...	...	...	...	...	5	...	...	214	13	10	
	...	...	...	...	...	...	...	...	...	...	1	...	114	113	4	
	...	...	...	...	...	...	...	...	...	...	...	2	56	54	2	
Tsolo...	...	...	2	...	...	...	...	...	...	...	...	...	55	...	1	18
	...	...	...	...	...	2	...	...	...	...	...	...	116	...	2	
	...	...	...	...	...	...	3	...	...	...	...	...	121	...	2	
	...	...	...	...	...	...	...	4	...	...	...	...	54	...	21	
	...	...	...	...	...	...	...	...	...	3	...	...	36	...	5	
	...	...	...	...	...	...	...	...	...	...	3	...	69	32	4	
	...	...	...	...	...	...	...	...	...	...	...	1	126	...	4	
Totals for 1906 ...	31	26	24	31	47	58	64	61	46	63	55	49	26,914	5,062	1,080	555
Totals for 1905 ...	11	14	9	31	21	11	24	17	17	13	13	24	9,990	2,574	266	187

* No details available.

† No details available in one case.

‡ Considered as Lungsick areas.

ANNEXURE (6.)

REDWATER.

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in the Herd (*b*) Inoculated with Virus, and (*c*) Died or destroyed during 1906, with conmparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus	Died or Destroyed	
Albany	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	10
	...	1	...	...	...	...	...	...	...	...	...	...	8	...	2	
	...	...	...	1	...	...	...	...	...	...	...	...	4	...	1	
	...	...	...	...	2	...	...	...	...	...	...	...	98	...	10	
	...	...	...	...	...	...	1	...	...	...	...	...	6	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	
	...	...	...	...	...	...	...	...	...	1	...	...	27	26	1	
	...	...	...	...	...	...	...	...	...	...	...	2	11	8	2	
Aliwal North ...	...	...	1	...	...	...	...	...	...	...	...	...	32	...	2	1
Barkly East	...	...	1	—	...	...	...	...	...	...	...	...	12	...	1	1
Barkly West	...	...	...	1	...	...	...	...	...	...	...	...	80	...	1	1
Cathcart	1	...	...	...	...	...	...	...	...	...	...	...	20	...	1	2
	...	...	...	1	...	...	...	...	...	...	...	...	40	...	2	
Fort Beaufort ...	...	...	1	...	...	...	...	...	...	...	...	...	79	...	3	2
	...	...	...	...	...	...	...	...	...	...	1	...	250	246	4	
*George	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glen Grey	...	1	...	...	...	...	...	...	...	...	...	...	52	...	1	1
Herschel	...	...	3	...	...	...	...	...	...	...	...	...	66	...	4	6
	...	...	...	2	...	...	...	...	...	...	...	...	70	...	4	
	...	...	...	...	1	...	...	...	...	...	...	...	15	...	1	
Humansdorp ...	...	1	...	...	...	...	...	...	...	...	...	...	20	...	1	2
	...	...	...	...	1	...	...	...	...	...	...	...	12	...	2	
King William's Town	...	...	...	...	...	...	1	...	...	...	...	...	30	...	1	1
*Knysna	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
*Mossel Bay... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oudtshoorn ...	...	3	...	...	...	...	...	...	...	...	...	...	43	...	5	7
	...	...	3	...	...	...	...	...	...	...	...	...	36	...	5	
	...	...	...	1	...	...	...	...	...	...	...	...	60	...	2	
Paarl...	...	...	...	...	1	...	...	...	...	...	...	...	†	...	†	1
Peddie	...	...	...	...	...	...	...	...	...	...	1	...	6	...	1	2
	...	...	...	...	...	...	...	...	...	...	...	1	49	...	1	
Port Elizabeth ...	...	...	1	...	...	...	...	...	...	...	...	...	32	...	2	2
	...	...	...	...	...	...	...	...	...	...	1	...	27	...	1	
Queenstown ...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	4
	...	...	...	2	...	...	...	...	...	...	...	...	18	...	4	
	...	...	...	...	...	1	...	...	...	...	...	...	26	...	...	
Stockenstrom ...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	1	1
Uitenhage	...	1	...	...	...	...	...	...	...	...	...	...	150	...	4	7
	...	...	1	...	...	...	...	...	...	...	...	...	69	68	1	
	...	...	...	1	...	...	...	...	...	...	...	...	90	...	...	
	...	...	...	...	...	1	...	...	...	...	...	...	100	...	11	
	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	104	91	9	
Victoria East ...	...	1	...	...	...	...	...	...	...	...	...	...	14	...	1	3
	...	...	...	...	1	...	...	...	...	...	...	...	60	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	25	...	4	
Wynberg	...	...	1	...	...	...	...	...	...	...	...	...	2	...	2	1
Native Territories. Tembuland.																
Elliot	...	...	1	...	...	...	...	...	...	...	...	...	78	...	11	1
Engcobo	...	1	...	...	...	...	...	...	...	...	...	...	12	...	1	1
St. Marks	...	15	...	...	...	...	...	...	...	...	...	...	585	...	23	35
	...	...	11	...	...	...	...	...	...	...	...	...	282	...	11	
	...	...	...	...	9	...	...	...	...	...	...	...	326	...	12	
Umtata	...	1	...	...	...	...	...	...	...	...	...	...	92	...	6	6
	...	...	...	...	...	1	...	...	...	...	...	...	10	...	2	
	...	...	...	...	...	...	...	...	...	2	...	...	54	...	3	
	...	...	...	...	...	...	...	...	...	...	2	...	46	...	3	
Xalanga	1	...	...	...	...	...	...	...	...	...	...	...	32	...	1	6
	...	5	...	...	...	...	...	...	...	...	...	...	181	...	18	

* These Divisions are considered as infected areas,

† No details available,

ANNEXURE (6.)

REDWATER—(*Continued.*)

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in the Herd; (*b*) Inoculated with Virus, and (*c*) Died or destroyed during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus	Died or Destroyed	
Transkei.																
Idutywa	...	...	...	...	...	...	...	1	...	...	...	...	35	...	1	1
Kentani	...	2	...	...	...	...	...	...	...	...	...	...	25	...	2	2
Nqamakwe	4	...	...	...	...	...	...	...	...	...	...	...	140	...	4	22
	...	6	...	...	...	...	...	...	...	...	...	...	339	...	7	
	...	...	3	...	...	...	...	...	...	...	...	...	225	...	5	
	...	...	...	1	...	...	...	...	...	...	...	...	12	...	1	
	...	...	...	...	4	...	...	...	...	...	...	...	74	...	4	
	...	...	...	...	...	...	...	...	...	...	2	...	94	...	6	
	...	...	...	...	...	...	...	...	...	...	...	2	26	...	2	
Willowvale	1	...	...	...	...	...	...	...	...	...	...	...	28	...	1	1
Pondoland.																
Flagstaff	...	1	...	...	...	...	...	...	...	...	...	...	21	...	2	2
	...	...	1	...	...	...	...	...	...	...	...	...	92	...	2	
Libode	...	...	...	...	...	1	...	...	...	...	...	...	22	...	...	2
	...	...	...	...	...	...	1	...	...	...	...	...	19	...	3	
Tabankulu	...	1	...	...	...	...	...	...	...	...	...	...	304	...	4	1
Griqualand East.																
Kokstad	...	...	...	...	1	...	...	...	...	...	...	...	68	...	5	1
Matatiele	4	...	...	...	...	...	...	...	...	...	...	...	601	...	25	9
	...	5	...	...	...	...	...	...	...	...	...	...	248	...	7	
Mount Fletcher ...	4	...	...	...	...	...	...	...	...	...	...	...	45	...	4	4
Qumbu	...	...	...	...	...	...	...	...	...	...	1	...	21	...	...	1
Tsolo	...	3	...	...	...	...	...	...	...	...	...	...	38	...	1	5
	...	...	...	1	...	...	...	...	...	...	...	...	10	...	1	
	...	...	...	...	1	...	...	...	...	...	...	...	13	...	1	
Totals for 1906 ...	16	48	29	11	21	4	4	3	...	3	8	8	6,049	439	281	155
Totals for 1905 ...	15	34	32	21	24	8	5	...	...	1	9	...	7,441	1,579	374	149

ANNEXURE (7.)

SCABIES (EQUINES).

Return showing Numbers of Outbreaks; the Division in which they Occurred; also numbers of Animals (*a*) in Stud, and (*b*) Died or Destroyed, during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals. (*a*)	(*b*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	In Stud.	Died or Destroyed.	
Cape	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1
Durbanville ...	...	...	...	...	...	1	...	...	...	...	...	...	1	1	2
	...	...	...	...	...	...	...	...	...	...	1	...	3	2	
Clanwilliam ...	...	...	...	...	...	...	...	1	...	...	...	...	4	...	1
Colesberg ...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	2
	...	...	...	...	...	1	...	...	...	...	...	...	1	...	
East London ...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	1
Port Elizabeth ...	...	...	...	...	...	1	...	...	...	...	...	...	56	...	1
Worcester ...	...	...	...	...	...	...	...	...	...	...	1	...	70	...	1
Wynberg ...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	3
	...	...	...	...	...	...	...	...	...	...	2	...	2	1	
Native Territories— Transkei.															
Nqamakwe ...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1
Griqualand East.															
Mount Frere ...	...	...	...	...	...	...	...	...	...	...	2	...	2	...	2
Totals for 1906 ...	...	1	...	...	2	4	...	1	...	1	6	...	146	4	15
Totals for 1905 ...	2	5	3	3	...	4	3	8	3	4	...	1	234	8	36

ANNEXURE (8).

SPONSZIEKTE.

Return showing numbers of Outbreaks; the Districts in which they occurred; also numbers of Animals (*a*) in Herd, (*b*) Inoculated with Virus, and (*c*) Died or destroyed, during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus.	Died or Destroyed.	
Albany	...	...	...	...	1	...	...	...	...	...	...	...	2	...	1	3
	...	...	...	...	...	...	...	...	...	...	1	...	57	53	4	
	...	...	...	...	...	...	...	...	...	...	...	1	27	26	1	
Aliwal North	...	...	...	...	...	...	1	...	...	...	...	...	30	29	1	2
	...	...	...	...	...	...	...	...	...	...	...	1	40	...	1	
Barkly East	...	4	...	...	...	...	...	...	...	...	...	...	67	...	7	4
Barkly West	...	...	...	...	...	...	...	...	1	...	...	...	*	*	*	1
Bedford	...	...	...	...	...	...	...	...	...	2	...	...	170	148	22	2
East London	...	1	...	...	...	...	...	...	...	...	...	...	70	...	3	17
	...	...	4	...	...	...	...	...	...	...	...	...	272	...	6	
	...	...	...	1	...	...	...	...	...	...	...	...	11	...	1	
	...	...	...	...	2	...	...	...	...	...	...	...	86	...	2	
	...	...	...	...	...	3	...	...	...	...	...	...	244	...	12	
	...	...	...	...	...	...	2	...	...	...	...	...	79	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	19	...	3	
	...	...	...	...	...	...	...	...	...	2	...	...	36	8	3	
	...	...	...	...	...	...	...	...	...	...	1	...	5	...	1	
Fort Beaufort	...	...	...	...	...	...	...	...	...	...	...	1	70	68	2	1
Herschel	1	...	...	...	...	...	...	...	...	...	...	...	38	...	2	26
	...	6	...	...	...	...	...	...	...	...	...	...	157	...	13	
	...	...	8	...	...	...	...	...	...	...	...	...	357	...	21	
	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	
	...	...	...	...	...	4	...	...	...	...	...	...	135	...	7	
	...	...	...	...	...	...	1	...	...	...	...	...	25	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	36	...	1	
	...	...	...	...	...	...	...	...	2	...	...	...	61	...	2	
	...	...	...	...	...	...	...	...	...	...	2	...	43	...	2	
Humansdorp	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	1
King William's Town	...	3	...	...	...	...	...	...	...	...	...	...	143	...	7	9
	...	...	...	1	...	...	...	...	...	...	...	...	43	...	1	
	...	...	...	...	...	1	...	...	...	...	...	...	8	...	1	
	...	...	...	...	...	...	...	2	...	...	...	...	162	...	4	
	...	...	...	...	...	...	...	...	...	...	1	...	46	...	3	
	...	...	...	...	...	...	...	...	...	...	...	1	65	...	3	
Komgha	1	...	...	...	...	...	...	...	...	...	...	...	70	...	1	1
Mafeking	...	...	...	...	1	...	...	...	...	...	...	...	200	187	13	3
	...	...	...	...	...	...	...	...	1	...	...	...	600	...	1	
	...	...	...	...	...	...	...	...	...	...	...	1	700	...	2	
Middelburg	...	1	...	...	...	...	...	...	...	...	...	...	8	...	2	1
Somerset East	...	...	1	...	...	...	...	...	...	...	...	...	48	...	1	1
Stockenstrom	...	...	2	...	...	...	...	...	...	...	...	...	50	35	4	2
Uitenhage	...	...	...	...	...	...	...	...	1	...	...	...	278	...	21	1
Native Territories—Tembuland.																
Elliotdale	...	...	...	...	...	...	1	...	...	...	...	...	11	...	1	8
	...	...	...	...	...	...	...	...	...	...	4	...	35	...	11	
	...	...	...	...	...	...	...	...	...	...	...	3	63	8	12	
Mqanduli	...	...	...	...	...	2	...	...	...	...	...	...	60	...	5	2
St. Marks	...	...	1	...	...	...	...	...	...	...	...	...	14	...	2	1
Umtata	...	...	...	...	...	...	...	...	...	...	2	...	97	...	10	2
Transkei.																
Kentani	...	1	...	...	...	...	...	...	...	...	...	...	24	...	1	10
	...	...	...	...	2	...	...	...	...	...	...	...	88	...	3	
	...	...	...	...	...	1	...	...	...	...	...	...	27	...	3	
	...	...	...	...	...	...	1	...	...	...	...	...	20	...	1	
	...	...	...	...	...	...	...	...	...	3	...	...	27	...	3	
	...	...	...	...	...	...	...	...	...	...	2	...	65	...	2	

* No details available.

ANNEXURE (8).

SPONSZIEKTE.—(*Continued.*)

Return showing numbers of Outbreaks; the District in which they occurred; also numbers of Animals (*a*) in Herd, (*b*) Inoculated with Virus, and (*c*) Died or destroyed, during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus.	Died or Destroyed.	
Nqmakwe	1	...	...	...	...	...	...	...	...	...	...	...	17	...	1	11
	...	2	...	...	...	...	...	...	...	...	...	...	108	...	3	
	...	...	3	...	...	...	...	...	...	...	...	...	63	...	4	
	...	...	...	1	...	...	...	...	...	...	...	...	83	...	1	
	...	...	...	...	...	...	1	...	...	...	...	...	29	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	7	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	142	...	8	
Willowvale	...	...	3	...	...	...	...	...	...	...	...	...	32	...	3	18
	...	...	...	4	...	...	...	...	...	...	...	...	97	...	11	
	...	...	...	...	3	...	...	...	...	...	...	...	72	...	5	
	...	...	...	...	...	...	...	1	...	...	...	...	25	...	2	
	...	...	...	...	...	...	...	...	1	...	...	...	29	...	2	
	...	...	...	...	...	...	...	...	...	1	...	...	30	...	2	
	...	...	...	...	...	...	...	...	...	...	4	...	135	...	7	
	...	...	...	...	...	...	...	...	...	...	...	1	10	...	1	
Pondoland.																
Libode	...	...	...	...	2	...	...	...	...	...	...	...	50	...	5	2
Lusikisiki	...	...	...	...	...	...	...	...	...	...	...	1	31	...	4	1
Nqgeleni	...	...	...	...	...	1	...	...	...	...	...	...	34	...	13	1
Griqualand East.																
Kokstad	...	...	1	...	...	...	...	...	...	...	...	...	60	...	...	2
	...	...	...	1	...	...	...	...	...	...	...	...	54	52	2	
Totals for 1906 ...	3	18	23	9	12	12	7	5	6	9	17	12	6,199	614	318	133
Totals for 1905 ...	2	...	4	5	8	5	8	12	12	9	8	5	2,273	71	179	78

ANNEXURE (9).

SWINE FEVER.

Return showing Numbers of Outbreaks; the District in which they occurred; also Numbers of Animals (*a*) in Drove, and (*b*) Died or Destroyed, during 1906, with Comparative Totals for 1905.

DISTRICT.	Numbers of Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Drove.	Died or Destroyed.	
Piquetberg	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1906	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1905	...	...	...	...	...	...	1	...	...	...	1	...	115	8	2

ANNEXURE (6.)

REDWATER.

Return showing Numbers of Outbreaks; the Divisions in which they occurred; also Numbers of Animals (*a*) in the Herd; (*b*) Inoculated with Virus, and (*c*) Died or destroyed during 1906, with commparative totals for 1905.

District.	Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus	Died or Destroyed	
Albany	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	10
	...	1	...	...	...	...	...	...	...	...	...	...	8	...	2	
	...	...	...	1	...	...	...	...	...	...	...	...	4	...	1	
	...	...	...	...	2	...	...	...	...	...	...	...	98	...	10	
	...	...	...	...	...	...	1	...	...	...	...	...	6	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	
	...	...	...	...	...	...	...	...	...	1	...	...	27	26	1	
	...	...	...	...	...	...	...	...	...	...	...	2	11	8	2	
Aliwal North ...	...	...	1	...	...	...	...	...	...	...	...	...	32	...	2	1
Barkly East... ...	...	...	1	—	...	...	...	...	...	...	...	...	12	...	1	1
Barkly West... ...	...	...	...	1	...	...	...	...	...	...	...	...	80	...	1	1
Cathcart	1	...	...	...	...	...	...	...	...	...	...	...	20	...	1	2
	...	...	...	1	...	...	...	...	...	...	...	...	40	...	2	
Fort Beaufort ...	...	...	1	...	...	...	...	...	...	...	...	...	79	...	3	2
	...	...	...	...	...	...	...	...	...	...	1	...	250	246	4	
*George	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glen Grey	...	1	...	...	...	...	...	...	...	...	...	...	52	...	1	1
Herschel	...	...	3	...	...	...	...	...	...	...	...	...	66	...	4	6
	...	...	...	2	...	...	...	...	...	...	...	...	70	...	4	
	...	...	...	...	1	...	...	...	...	...	...	...	15	...	1	
Humansdorp ...	...	1	...	...	...	...	...	...	...	...	...	...	20	...	1	2
	...	...	...	...	1	...	...	...	...	...	...	...	12	...	2	
King William's Town	...	...	...	...	...	...	1	...	...	...	...	...	30	...	1	1
*Knysna	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
*Mossel Bay... ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oudtshoorn ...	...	3	...	...	...	...	...	...	...	...	...	...	43	...	5	7
	...	...	3	...	...	...	...	...	...	...	...	...	36	...	5	
	...	...	...	1	...	...	...	...	...	...	...	...	60	...	2	
Paarl...	...	...	...	...	1	...	...	...	...	...	...	...	†	...	†	1
Peddie	...	...	...	...	...	...	...	...	...	...	1	...	6	...	1	2
	...	...	...	...	...	...	...	...	...	...	...	1	49	...	1	
Port Elizabeth ...	...	...	1	...	...	...	...	...	...	...	...	...	32	...	2	2
	...	...	...	...	...	...	...	...	...	...	1	...	27	...	1	
Queenstown ...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	4
	...	...	...	2	...	...	...	...	...	...	...	...	18	...	4	
	...	...	...	...	...	1	...	...	...	...	...	...	26	...	...	
Stockenstrom ...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	1	1
Uitenhage	...	1	...	...	...	...	...	...	...	...	...	...	150	...	4	7
	...	...	1	...	...	...	...	...	...	...	...	...	69	68	1	
	...	...	...	1	...	...	...	...	...	...	...	...	90	...	...	
	...	...	...	...	...	1	...	...	...	...	...	...	100	...	11	
	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	104	91	9	
Victoria East ...	...	1	...	...	...	...	...	...	...	...	...	...	14	...	1	3
	...	...	...	...	1	...	...	...	...	...	...	...	60	...	1	
	...	...	...	...	...	...	...	1	...	...	...	...	25	...	4	
Wynberg	...	...	1	...	...	...	...	...	...	...	...	...	2	...	2	1
Native Territories. Tembuland.																
Elliot	...	...	1	...	...	...	...	...	...	...	...	...	78	...	11	1
Engcobo	...	1	...	...	...	...	...	...	...	...	...	...	12	...	1	1
St. Marks	...	15	...	...	...	...	...	...	...	...	...	...	585	...	23	35
	...	...	11	...	...	...	...	...	...	...	...	...	282	...	11	
	...	...	...	...	9	...	...	...	...	...	...	...	326	...	12	
Umtata	...	1	...	...	...	...	...	...	...	...	...	...	92	...	6	6
	...	...	...	...	...	1	...	...	...	...	...	...	10	...	2	
	...	...	...	...	...	...	...	...	...	2	...	...	54	...	3	
	...	...	...	...	...	...	...	...	...	...	2	...	46	...	3	
Xalanga	1	...	...	...	...	...	...	...	...	...	...	...	32	...	1	6
	...	5	...	...	...	...	...	...	...	...	...	...	181	...	18	

* These Divisions are considered as infected areas,

† No details available,

ANNEXURE (8).

SPONSZIEKTE.—(*Continued.*)

Return showing numbers of Outbreaks; the District in which they occurred; also numbers of Animals (*a*) in Herd, (*b*) Inoculated with Virus, and (*c*) Died or destroyed, during 1906, with comparative totals for 1905.

District.	Outbreaks, 1906.												Number of Animals.			Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept	Oct.	Nov.	Dec.	(*a*) In Herd.	(*b*) Inoculated with Virus.	(*c*) Died or Destroyed.	
Nqmakwe	1	...	...	...	...	...	...	...	...	...	...	...	17	...	1	11
	...	2	...	...	...	...	...	...	...	...	...	...	108	...	3	
	...	...	3	...	...	...	...	...	...	...	...	...	63	...	4	
	...	...	...	1	...	...	...	...	...	...	...	...	83	...	1	
	...	...	...	...	...	...	1	...	...	...	...	...	29	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	7	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	142	...	8	
Willowvale	...	...	3	...	...	...	...	...	...	...	...	...	32	...	3	18
	...	...	...	4	...	...	...	...	...	...	...	...	97	...	11	
	...	...	...	...	3	...	...	...	...	...	...	...	72	...	5	
	...	...	...	...	...	...	...	1	...	...	...	...	25	...	2	
	...	...	...	...	...	...	...	...	1	...	...	...	29	...	2	
	...	...	...	...	...	...	...	...	...	1	...	...	30	...	2	
	...	...	...	...	...	...	...	...	...	...	4	...	135	...	7	
	...	...	...	...	...	...	...	...	...	...	...	1	10	...	1	
Pondoland.																
Libode	...	...	...	...	2	...	...	...	...	...	...	...	50	...	5	2
Lusikisiki	...	...	...	...	...	...	...	...	...	...	...	1	31	...	4	1
Nqgeleni	...	...	...	...	...	1	...	...	...	...	...	...	34	...	13	1
Griqualand East.																
Kokstad	...	...	1	...	...	...	...	...	...	...	...	...	60	...	...	2
	...	...	...	1	...	...	...	...	...	...	...	...	54	52	2	
Totals for 1906 ...	3	18	23	9	12	12	7	5	6	9	17	12	6,199	614	318	133
Totals for 1905 ...	2	...	4	5	8	5	8	12	12	9	8	5	2,273	71	179	78

ANNEXURE (9).

SWINE FEVER.

Return showing Numbers of Outbreaks; the District in which they occurred; also Numbers of Animals (*a*) in Drove, and (*b*) Died or Destroyed, during 1906, with Comparative Totals for 1905.

District.	Numbers of Outbreaks, 1906.												Numbers of Animals.		Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	(*a*) In Drove.	(*b*) Died or Destroyed.	
Piquetberg	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1906	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1905	...	...	...	...	...	...	1	...	...	...	1	...	115	8	2

ANNEXURE (8).

SPONSZIEKTE.

Return showing numbers of Outbreaks; the Districts in which they occurred; also numbers of Animals (*a*) in Herd, (*b*) Inoculated with Virus, and (*c*) Died or destroyed, during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus.	Died or Destroyed.	
Albany	...	...	...	...	1	...	...	...	...	...	...	...	2	...	1	3
	...	...	...	...	...	...	...	...	...	...	1	...	57	53	4	
	...	...	...	...	...	...	...	...	...	...	...	1	27	26	1	
Aliwal North ...	...	...	...	...	...	...	1	...	...	...	...	...	30	29	1	2
	...	...	...	...	...	...	...	...	...	...	...	1	40	...	1	
Barkly East ...	...	4	...	...	...	...	...	...	...	...	...	...	67	...	7	4
Barkly West ...	...	...	...	...	...	...	...	...	1	...	...	...	*	*	*	1
Bedford	...	...	...	...	...	...	...	...	...	2	...	...	170	148	22	2
East London ...	...	1	...	...	...	...	...	...	...	...	...	...	70	...	3	17
	...	...	4	...	...	...	...	...	...	...	...	...	272	...	6	
	...	...	...	1	...	...	...	...	...	...	...	...	11	...	1	
	...	...	...	...	2	...	...	...	...	...	...	...	86	...	2	
	...	...	...	...	...	3	...	...	...	...	...	...	244	...	12	
	...	...	...	...	...	...	2	...	...	...	...	...	79	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	19	...	3	
	...	...	...	...	...	...	...	...	...	2	...	...	36	8	3	
	...	...	...	...	...	...	...	...	...	...	1	...	5	...	1	
Fort Beaufort ...	...	...	...	...	...	...	...	...	...	...	...	1	70	68	2	1
Herschel	1	...	...	...	...	...	...	...	...	...	...	...	38	...	2	26
	...	6	...	...	...	...	...	...	...	...	...	...	157	...	13	
	...	...	8	...	...	...	...	...	...	...	...	...	357	...	21	
	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	
	...	...	...	...	...	4	...	...	...	...	...	...	135	...	7	
	...	...	...	...	...	...	1	...	...	...	...	...	25	...	2	
	...	...	...	...	...	...	...	1	...	...	...	...	36	...	1	
	...	...	...	...	...	...	...	...	2	...	...	...	61	...	2	
	...	...	...	...	...	...	...	...	...	...	2	...	43	...	2	
Humansdorp ...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	1	1
King William's Town	...	3	...	...	...	...	...	...	...	...	...	...	143	...	7	9
	...	...	...	1	...	...	...	...	...	...	...	...	43	...	1	
	...	...	...	...	...	1	...	...	...	...	...	...	8	...	1	
	...	...	...	...	...	...	...	2	...	...	...	...	162	...	4	
	...	...	...	...	...	...	...	...	...	...	1	...	46	...	3	
	...	...	...	...	...	...	...	...	...	...	...	1	65	...	3	
Komgha	1	...	...	...	...	...	...	...	...	...	...	...	70	...	1	1
Mafeking	...	...	...	...	1	...	...	...	...	...	...	...	200	187	13	3
	...	...	...	...	...	...	...	...	1	...	...	...	600	...	1	
	...	...	...	...	...	...	...	...	...	...	...	1	700	...	2	
Middelburg ...	...	1	...	...	...	...	...	...	...	...	...	...	8	...	2	1
Somerset East ...	...	...	1	...	...	...	...	...	...	...	...	...	48	...	1	1
Stockenstrom ...	...	...	2	...	...	...	...	...	...	...	...	...	50	35	4	2
Uitenhage	...	...	...	...	...	...	...	...	1	...	...	...	278	..	21	1
Native Territories—Tembuland.																
Elliotdale	...	...	...	...	...	...	1	...	...	...	...	...	11	...	1	8
	...	...	...	...	...	...	...	...	...	...	4	...	35	...	11	
	...	...	...	...	...	...	...	...	...	...	...	3	63	8	12	
Mqanduli	...	...	...	...	...	2	...	...	...	...	...	...	60	...	5	2
St. Marks	...	...	1	...	...	...	...	...	...	...	...	...	14	...	2	1
Umtata	...	...	...	...	...	...	...	...	...	...	2	...	97	...	10	2
Transkei.																
Kentani	...	1	...	...	...	...	...	...	...	...	...	...	24	...	1	10
	...	...	...	...	2	...	...	...	...	...	...	...	88	...	3	
	...	...	...	...	...	1	...	...	...	...	...	...	27	...	3	
	...	...	...	...	...	...	1	...	...	...	...	...	20	...	1	
	...	...	...	...	...	...	...	...	...	3	...	...	27	...	3	
	...	...	...	...	...	...	...	...	...	...	2	...	65	...	2	

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* No details available.

ANNEXURE (8).

SPONSZIEKTE.—(*Continued.*)

Return showing numbers of Outbreaks; the District in which they occurred; also numbers of Animals (*a*) in Herd, (*b*) Inoculated with Virus, and (*c*) Died or destroyed, during 1906, with comparative totals for 1905.

DISTRICT.	Outbreaks, 1906.												Number of Animals. (*a*)	(*b*)	(*c*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Herd.	Inoculated with Virus.	Died or Destroyed.	
Nqmakwe	1	...	...	...	...	...	...	...	...	...	...	...	17	...	1	11
	...	2	...	...	...	...	...	...	...	...	...	...	108	...	3	
	...	...	3	...	...	...	...	...	...	...	...	...	63	...	4	
	...	...	...	1	...	...	...	...	...	...	...	...	83	...	1	
	...	...	...	...	...	...	1	...	...	...	...	...	29	...	1	
	...	...	...	...	...	...	...	...	...	1	...	...	7	...	1	
	...	...	...	...	...	...	...	...	...	...	...	2	142	...	8	
Willowvale	...	...	3	...	...	...	...	...	...	...	...	...	32	...	3	18
	...	...	...	4	...	...	...	...	...	...	...	...	97	...	11	
	...	...	...	...	3	...	...	...	...	...	...	...	72	...	5	
	...	...	...	...	...	...	...	1	...	...	...	...	25	...	2	
	...	...	...	...	...	...	...	...	1	...	...	...	29	...	2	
	...	...	...	...	...	...	...	...	...	1	...	...	30	...	2	
	...	...	...	...	...	...	...	...	...	...	4	...	135	...	7	
	...	...	...	...	...	...	...	...	...	...	...	1	10	...	1	
Pondoland.																
Libode	...	...	...	...	2	...	...	...	...	...	...	...	50	...	5	2
Lusikisiki	...	...	...	...	...	...	...	...	...	...	...	1	31	...	4	1
Nqgeleni	...	...	...	...	...	1	...	...	...	...	...	...	34	...	13	1
Griqualand East.																
Kokstad	...	...	1	...	...	...	...	...	...	...	...	...	60	...	...	2
	...	...	...	1	...	...	...	...	...	...	...	...	54	52	2	
Totals for 1906 ...	3	18	23	9	12	12	7	5	6	9	17	12	6,199	614	318	133
Totals for 1905 ...	2	...	4	5	8	5	8	12	12	9	8	5	2,273	71	179	78

ANNEXURE (9).

SWINE FEVER.

Return showing Numbers of Outbreaks; the District in which they occurred; also Numbers of Animals (*a*) in Drove, and (*b*) Died or Destroyed, during 1906, with Comparative Totals for 1905.

DISTRICT.	Numbers of Outbreaks, 1906.												Numbers of Animals. (*a*)	(*b*)	Total Number of Outbreaks in District.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	In Drove.	Died or Destroyed.	
Piquetberg	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1906	...	...	1	...	...	...	...	...	...	...	...	...	1	1	1
Total for 1905	...	...	...	...	...	...	1	...	...	...	1	...	115	8	2

ANNEXURE (10).

TUBERCULOSIS.

Return showing Number of Outbreaks, the Districts in which they occurred ; also the Number of Animals (*a*) in herd, (*b*) innoculated with vaccine, and (*c*) died or destroyed during 1906, with Comparative Figures for 1905.

DISTRICT.	Number of Outbreaks, 1906.												No. of Animals.			Total No. of Outbreaks in Division.
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	(*a*) In Herd.	(*b*) Inoculated with Vaccine.	(*c*) Died or Destroyed.	
Cape	1	...	...	...	...	...	...	...	...	...	...	...	15	15	2	3
	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	
	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	
Ceres	...	...	...	...	...	...	...	...	1	...	...	...	247	235	5	1
East London ...	...	...	1	...	...	...	...	...	...	...	...	...	2	2	1	2
	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	
Mafeking	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	1
Wynberg	...	1	...	...	...	...	...	...	...	...	...	...	2	2	1	5
	...	...	...	1	...	...	...	...	...	...	...	...	11	10	1	
	...	...	...	...	1	...	...	...	...	...	...	...	3	3	3	
	...	...	...	...	...	1	...	...	...	...	...	...	37	36	1	
	...	...	...	...	...	...	...	...	...	...	...	1	4	...	4	
Native Territories: Griqualand East.																
Kokstad	...	1	...	...	...	...	...	...	...	...	...	...	°	°	°	1
Totals for 1906 ...	1	3	1	2	1	3	...	...	1	...	...	1	325	303	22	13
Totals for 1905 ...	...	...	...	...	...	1	1	...	...	1	...	...	9	8	6	3

° No details available.

ANNEXURE (11).

Return showing Total Numbers of Animals affected in all Animal Diseases scheduled under Act No. 27 of 1893, also the Percentage of Deaths of those Quarantined, and the Average Number of Deaths per Outbreak, during 1906, with Comparative Figures for 1905.

DISEASES.	Number of Out-breaks.	Total Number of Animals.			Percentage of Deaths to Number of Animals in Herd, Stud, &c.		Average Number of Deaths per Outbreak.	
		In Herd, Stud, &c.	Tested, Inocu-lated, &c.	Died or De-troyed.	1906.	1905.	1906.	1905.
Anthrax	66	6,418	1,514	190	2·96	8·00	2·88	5·6
Epizootic Lymphangitis...	9	20	...	4	44·44	13·04	2·25	·6
Glanders	88	644	490	165	53·33	23·08	1·88	2·31
Lungsickness	555	26,914	5,062	1,080	51·38	4·54	1·95	3·43
Redwater	155	6,049	439	281	55·16	5·03	1·81	2·51
Scabies (Equine) ...	15	146	...	4	26·66	3·42	·27	·22
Sponsziekte	133	6,199	614	318	41·82	7·88	2·39	2·32
Swine Fever	1	1	...	1	100·	6·96	100·	4·0
Tuberculosis	13	325	303	22	59·09	66·67	1·69	2·0
1906	1,035	46,716	8,422	2,065	4·42	...	2·	...
1905	624	24,371	5,814	1,272	...	5·22	...	2·04

ANNEXURE (12.)

Return showing the Quantity and Value of Live Stock exported oversea from Cape Colony during 1906, with comparative totals for 1905.

DESCRIPTION.	1906.		1905.	
	Number.	Value.	Number.	Value.
		£		£
Horses	2,019	50,501	3,556	76,415
Mules	522	13,241	12,280	325,554
Donkeys	882	11,423	7,661	79,071
Cattle	8,643	142,438	12,066	318,778
Sheep	9,767	10,875	9,436	11,242
Goats	...	...	171	329
Pigs	2,121	6,181	595	1,659
Dogs	1	20	7	30
Poultry	...	1,950	6,159	1,230
Totals	23,955	236,629	51,931	814,308

N.B.—This Table is compiled from statistics supplied by the courtesy of the Principal of the South African Statistical Bureau.

ANNEXURE (13.)

Return of Live Stock examined and passed by the Veterinary Department into the Cape Colony through the Ports of Cape Town, Port Elizabeth and East London from Oversea during 1906, with comparative Totals for 1905.

DATE.		Horses.	Mules.	Donkeys.	Cattle.	Sheep.	Goats.	Pigs.	Dogs.	Cats.	Monkeys.	Various.	Monthly Totals.	
													1906.	1905.
January		774	433	198	90	23	...	5	33	1	...	20	1,577	501
February		331	444	...	392	119	...	4	13	3	...	9	1,315	621
March		206	53	...	24	71	...	14	52	...	...	17	437	2,138
April		211	1,083	444	247	91	...	...	32	...	4	2	2,114	5,357
May		143	513	154	9	67	...	...	68	2	...	...	956	3,803
June		49	139	...	26	1	...	...	10	3	...	...	228	1,862
July		258	543	191	14	16	...	7	21	...	...	...	1,050	513
August		82	368	...	10	19	18	3	20	1	...	...	521	489
September		6	100	...	59	120	6	2	17	1	...	...	311	1,286
October		115	54	2	7	141	20	2	32	4	2	2	381	1,160
November		197	...	...	16	237	2	6	16	2	1	1	478	1,898
December		607	371	...	18	15	...	8	18	4	...	...	1,076	1,112
Totals for 1906.	Cape Town	2,908	3,791	989	763	418	18	27	259	20	5	49	9,247	18,804
	Pt. Elizabeth	55	300	...	57	378	28	13	40	1	2	2	876	1,566
	East London	16	10	...	92	159	...	11	33	...	...	...	321	370
	Cape Colony	2,979	4,101	989	912	955	46	51	332	21	7	51	10,444	...
Totals for 1905 ...		6,019	4,148	2,474	1,514	6,138	10	27	292	27	1	90	...	20,740

ANNEXURE (14).

Return showing Numbers of the Respective Outbreaks of Animal Diseases Scheduled under Act No. 27 of 1893 in the various Districts of the Cape Colony during 1906, with Comparative Figures for 1905.

District.	Anthrax.		Epizootic Lymphangitis		Glanders.		Lung-sickness.		Redwater.		Scabies (Equine).		Sponsziekte.		Swine Fever.		Tuberculosis.		Totals.	
	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.
Albany	1	3	...	...	3	2	2	...	10	4	...	2	3	1	...	...	...	...	19	12
Albert	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	1	2
Alexandria	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Aliwal North	...	...	...	...	2	3	...	...	1	...	...	...	2	...	...	...	...	...	5	3
Barkly East	1	...	...	...	...	...	1	...	1	...	...	...	4	7	...	...	...	...	7	7
Barkly West	2	3	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	5	3
Klipdam	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...
Bathurst	1	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...	...	1	4
Beaufort West	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Bedford	3	3	...	...	...	...	...	1	...	...	...	...	2	...	...	...	...	...	5	4
Bredasdorp	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
De Aar	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Caledon	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Calvinia	...	...	...	...	1	4	...	...	...	...	...	...	...	...	...	...	...	...	1	4
Cape	...	...	1	2	5	9	...	...	...	...	1	10	...	...	...	...	3	2	10	23
Durbanville	...	...	...	...	1	1	...	...	...	...	2	...	...	...	...	...	...	...	3	1
Carnarvon	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	3
Cathcart	...	...	...	...	1	...	...	3	2	...	...	...	...	1	...	...	...	...	3	4
Ceres	...	...	...	...	2	5	...	...	...	...	...	...	...	...	...	...	1	...	3	5
Clanwilliam	...	...	1	...	1	5	...	...	...	...	1	2	...	...	...	...	...	...	3	7
Colesberg	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	2	...
Cradock	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
East London	4	4	2	...	5	1	86	23	...	...	1	2	17	18	...	...	2	...	117	48
Fort Beaufort	...	2	...	...	...	1	2	3	2	2	...	...	1	4	...	...	...	...	5	12
Glen Grey	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	...	...	...	2	2
Gordonia	...	1	...	...	...	...	39	10	...	...	...	...	...	...	...	...	...	...	39	11
Hay	2	1	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	6	1
Herbert	...	2	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	2
Herschel	...	...	...	...	...	...	...	...	6	...	...	...	26	1	...	...	...	...	32	1
Humansdorp	...	...	...	1	3	...	...	...	2	7	...	...	1	...	...	...	...	...	6	8

ANNEXURE (14).—*contd.*

RETURN showing Numbers of the Respective Outbreaks of Animal Diseases Scheduled under Act No. 27 of 1893 in the various Districts of the Cape Colony during 1906, with Comparative Figures for 1905.

DISTRICT.	Anthrax.		Epizootic Lymphangitis		Glanders.		Lung-sickness.		Redwater.		Scabies (Equine).		Sponsziekte.		Swine Fever.		Tuberculosis.		Totals.	
	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.
Jansenville	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	4
Kenhardt	...	...	...	...	...	...	8	1	...	...	...	...	...	...	...	...	...	...	8	1
Kimberley	5	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...
King William's Town	2	6	1	...	5	3	45	19	1	...	...	3	9	...	...	...	...	...	63	31
Knysna	...	...	...	...	1	3	...	1	...	3	...	...	...	6	...	...	...	...	69	13
Komgha	3	6	...	...	...	...	68	17	...	...	...	...	1	3	...	...	...	...	4	26
Kuruman	...	...	...	...	...	...	7	1	...	...	...	...	...	...	...	...	...	...	7	1
Ladismith	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2
Mafeking	2	1	...	1	...	...	1	...	...	...	...	3	3	...	...	...	1	...	7	5
Malmesbury	...	...	1	2	3	5	...	...	...	...	...	...	...	...	...	2	...	...	4	9
Middelburg	...	...	...	...	1	...	...	...	...	...	...	...	1	2	...	...	...	...	2	2
Molteno	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Montagu	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
Mossel Bay	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	3
Namaqualand	...	...	...	...	5	1	4	...	...	...	...	...	...	...	...	...	...	...	9	1
Oudtshoorn	...	...	...	...	2	2	...	2	7	15	...	...	...	...	...	...	...	...	9	19
Paarl	...	...	...	...	2	3	...	...	1	...	...	...	...	...	...	...	...	...	3	3
Peddie	1	2	...	...	1	...	24	...	2	3	...	...	...	1	...	...	...	...	28	6
Philip's Town	...	...	...	...	...	1	...	...	...	...	...	...	...	..	...	...	...	...	...	1
Piquetberg	1	...	...	...	1	1	...	...	...	...	...	...	...	...	1	..	...	...	3	1
Port Elizabeth	...	...	...	2	2	1	...	...	2	4	1	...	...	...	...	...	...	...	5	7
Prieska	1	...	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	3	2
Prince Albert	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Queenstown	1	...	...	...	...	...	...	1	4	1	...	...	...	1	...	...	...	...	5	3
Richmond	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Riversdale	...	...	...	...	...	5	...	...	...	2	...	...	...	...	...	...	...	...	...	7
Robertson	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Simon's Town	...	...	...	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	1	3
Somerset East	...	...	1	...	...	1	...	...	...	...	...	...	1	2	...	...	...	...	2	3
Stellenbosch	...	...	...	1	1	4	...	...	...	...	...	2	...	...	...	...	...	1	1	8
Somerset West	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1

ANNEXURE (14)—*contd.*

RETURN showing numbers of the respective Outbreaks of Animal Diseases scheduled under Act No. 27 of 1893 in the various Districts of the Cape Colony during 1906, with Comparative Figures for 1905.

DISTRICT.	Anthrax.		Epizootic Lymphangitis		Glanders.		Lung-sickness.		Redwater.		Scabies (Equine).		Sponsziekte.		Swine Fever.		Tuberculosis.		Totals.	
	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.	1906.	1905.
Pondoland.																				
Bizana	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...	2	1
Flagstaff	...	...	...	...	...	2	2	...	2	...	...	...	...	...	...	...	...	...	4	2
Libode	...	1	...	...	...	...	2	1	2	...	...	...	2	...	...	...	...	...	6	2
Lusikisiki	1	...	...	...	1	...	8	...	...	...	...	...	1	...	...	...	...	...	11	...
Ngqeleni	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...
Tabankulu	...	...	...	...	...	...	5	5	1	2	...	...	...	...	...	...	...	...	6	7
Griqualand East.																				
Kokstad	...	...	...	...	...	3	1	2	1	1	...	...	2	...	...	...	1	...	5	6
Maclear	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...
Matatiele	...	...	...	...	2	...	2	1	9		...	1	...	...	...	...	...	...	13	2
Mount Ayliff	...	...	...	...	...	...	5	12	...	27	...	...	...	...	...	...	...	...	5	39
Mount Fletcher	...	...	...	...	...	...	1	1	4	5	...	...	...	...	...	...	...	...	5	6
Mount Frere	...	...	...	...	...	1	14	4	...	...	2	...	...	...	...	...	...	...	16	5
Qumbu	...	...	...	...	...	...	14	3	1	1	...	...	...	...	...	...	...	...	15	4
Tsolo	2	...	...	...	...	...	18	4	5	1	...	...	...	...	...	...	...	...	25	5
Umzimkulu	1	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	1	2
Totals for 1906	66	...	9	...	88	...	555	...	155	...	15	...	133	...	1	...	13	...	1035	...
Totals for 1905	...	45	...	15	...	109	...	187	...	149	...	36	...	78	...	2	...	3	...	624

Veterinary Department,
Cape Town, 18th April, 1907.

E. CHRIS. GATES,
Statistical Clerk.

APPENDIX II.

REPORT of the Director, Veterinary Laboratory, Grahamstown, for the Year 1906.

I have the honour to submit a brief resume of my work since taking over the Veterinary Laboratory in August, 1906.

The principal work of the place is the preparation and supply of certain preventive Vaccines and the distribution of others imported from Europe. I have dealt with the amount of each prepared and distributed under their separate heads.

The preventive Vaccine for Lungsickness is in steady demand, and owing to want of uniformity in results following the inoculation for its preparation, a considerable number of calves are required. I find that even when a calf does not develop the usual œdematous swelling the animal can be kept for a week or two and then sold, so as a rule only those calves which develop the required lesion are slaughtered, and when such is the case the value of the result and virus is far in excess of the value of the calves used.

So far the Lungsickness Virus sent out by this Laboratory has given most excellent results when properly used. To give an example, at Salem the disease appeared amongst a troop of native cattle 300 in number, seven cases in all, the animals were grazed together, and at the investigation of the local clergyman, the owners inoculated all in contact, only four more cases appeared, and the disease completely disappeared. The reports from private users of the virus are equally satisfactory.

Redwater.—This vaccine maintains its popularity and efficacy, and buyers of stock at the local Stock Fair are having their purchases inoculated as a matter of rule.

Even adjoining farms in this Redwater area differ, one being a Redwater veld and the other free. The commonage is a most deadly grazing ground, any uninoculated animal running there contracts the disease in a very short space of time, and in a most virulent form.

Malarial Fever in Sheep.—I have increased the bleeding flock to thirty, well fortified sheep, and am in a position to meet all reasonable demands in the Colony, I have had requests from the Transvaal, Orange River Colony, and Natal for large orders, but with your approval declined to supply until I knew the Colony's demands for the coming season. It would be easy enough to raise the number of the bleeding herd to meet any demand, but this would mean increased expense, and I think that the cost of the Bluetongue Serum barely covers cost of production with sheep at their present price.

Mallein.—This diagnostic agent is still in much demand and seems to give every satisfaction.

Black Quarter Vaccine.—This vaccine is coming more and more into use, the double powder form (Airlong Cornevin and Thomas) even with all the troubles attending its use, being deemed more reliable than any other form of preventive vaccination.

Anthrax Vaccine.—This is also coming into use, and seems to give good results despite the age of the vaccine.

Lamziekte.—I have had no opportunities of studying this disease. From all descriptions the name is not applicable to the disease described. The Lamziekte I know is where the animal loses power of locomotion, lies about the kraal, but will feed for weeks and weeks, and is a disease where the administration of Bone meal acts as a preventive, and in some cases as a curative. The disease called Lamziekte by some farmers here appears to be sudden in onset, rapidly fatal, and to shew no P.M. lesions beyond congestion of the Abamasum and small intestine. Such being the case, it is extremely difficult for me to obtain cases of and *P.M.'s* in animals so affected; the farms are far from town and the weather is hot, so by the time I get out there the cow is dead and the carcass in an advanced state of putrefaction.

Two cases of the disease on which I have been fortunate enough to obtain *post-mortems* shewing all the symptoms of death from some irritant poison, but with the splendid season we do not hear so much of Lamziekte, whether the disease is less, or the farmers feel their losses less, I cannot say. One farmer who had several cases of Lamziekte, found it disappear after inoculation against Anthrax, and others say that dipping their cattle acts as somewhat of a preventive, but at present I know very little about the disease. It is a matter for regret that the Government could not see their way to provide the money for an experiment on a large scale in this area, similar to that under way at Koopmansfontein, and if the latter yields indefinite results, I hope the matter will not be lost sight of.

In regard to the Laboratory and outbuildings, the Laboratory proper is in a good state of repair, but it will become absolutely necessary to renovate the stables and cow-sheds at an early date, to delay long will simply cause the Government to be out of pocket to a large extent, as several of the roofs and walls will stand a long time if attended to; as it is, the rains are doing lots of damage for want of a little paint and plaster and a few slates.

I trust the Director will see his way this coming year to allow me the entire daily service of a clerk. The correspondence is large for the place and the system of despatching Vaccine (insisted on by the Accountant) is most complicated and involved, but a glance at the monthly return of outstandings will be better than any further explanation. From this you will see that the services of a trained man are necessary to keep financial affairs straight, and that it takes all his day to do it satisfactorily. Another matter I should like to touch upon. At present I am debited with all purchases, but receive no credit for sales of used stock or vaccines. I purchase eighteen oxen to use as a test for my Redwater vaccine, and then sell the span for more than purchase price; my vote is debited with the purchase price, but nothing is credited when the sale took place. This will be awkward, as I shall have frequent purchases and sales on similar lines, and a time will come when the Accountant will declare that my vote is expended, *i.e.*, my vote has simply been absorbed into general revenue.

Free Clinique at Veterinary Laboratory.—In addition to the sick animals visited in town and neighbourhood by Veterinary Surgeon Lyons, the District Veterinary Officer, and myself in his absence, many people come up to the Laboratory between the hours of nine and ten a.m., and I am glad that the Director has decided to make a small charge for such services simply to cover the wear and tear of Instruments, Antiseptics, Dressings, etc., and as a set-off against the Boys' time when casting or other restraint is necessary.

In regard to the Sheds and Buildings, as I mentioned before, certain of the latter require renovating and certain additions are very necessary. It is absolutely necessary that the cattle kraals be covered over, more particularly is this the case of the Redwater Herd and Lungsick Vaccine Calves; we have lots of rain here, and it is a very objectionable sight to see the cattle standing in two feet of mud, and does not impress visitors with a high idea of our abilities as stockmen and managers, and if the matter is unfavourably commented on at some distant date I trust I will be exonerated from blame.

I have the honour to attach herewith memorandum showing details.

Redwater.

Doses sent out, 912.

This Vaccine maintains its popularity. I have now a herd of ten thoroughly salted oxen in good condition and perfectly healthy, the blood of which has been tested and proved innocuous on susceptible animals to render the chance of producing the disease Redwater impossible.

In inoculating animals against Redwater I prefer to use the blood of animals which have been artificially rendered immune to the disease by several doses of immune blood.

In testing an immune animal's blood for its value as a preventive, several presumably susceptible animals should be taken out of a span from a presumably clean farm. I have seen several refuse to react and several have reactions up to 107 deg. F. when inoculated with the same salted blood.

Some authorities consider that young stock stand the inoculation better than old, here I have not noticed any appreciable difference. A glance at the temperature charts will shew to what a variable extent stock from the same district react to a dose of blood from an immune Redwater Ox.

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In order to demonstrate if the immune Redwater Blood possessed keeping properties, an experiment on these lines was started by Veterinary Surgeon Bowhill, but never brought to a satisfactory conclusion. At present I have inoculated seven cattle from Somerset East which have each received 10 c.c. of blood from an Immune Redwater Ox at intervals of one day, typical reactions ensued, and no bad effects, and I now propose running these cattle on the Grahamstown Commonage with two clean uninoculated cattle as controls to judge of the value of the experiment.

Cattle from the Western Province, particularly from the vicinity of Cape Town, are usually credited with being extremely susceptible to Redwater; to such an extent is this believed that many breeders in this area refuse to have anything to do with the so-called Cape Cows on their arrival here, hence many consignees of such stock have been heavy losers.

To ascertain how far it was necessary to modify our present method of Redwater inoculation to suit such animals, six animals of the susceptible class were sent round from the Western Province to the Laboratory; they were placed in stalls in a stable which had never housed cattle and bedded on sawdust impregnated with paraffin oil, the food was baled forage, bran and pollard, and the stable and surroundings were rendered as tick free and tick proof as possible.

One Cow in calf was inoculated.

One Cow recently calved was inoculated.

One Cow calved was inoculated with salted blood.

One Cow calved was inoculated with blood of calf inoculated with blood (*i.e.*, the infection passed through the calf).

At present the experiment is under way, and results will be reported in due course.

Duration of Immunity due to Inoculation.—A farmer near Grahamstown, who is on veld adjoining the Commonage of this town, and who has always imagined his farm to be one affected with Redwater, inoculated his cattle in May, 1906. In December he trekked with all his oxen to the Alexandria district to obtain poles; on his return thirteen (out of 72) oxen became sick, seven shewed all the symptoms of Redwater, six having the P. Bigeminum in the blood; all recovered with the usual treatment. Therefore I take it that under certain circumstances it is advisable to inoculate cattle every year.

Presence or Absence of the Piroplasma in Inoculated Cattle.—In seventeen cattle inoculated with the Blood of Salted or Recovered animals I was able to demonstrate the presence of the P. Bigeminum in one or other of its forms, and I found that the relative number of parasites had nothing to do with the temperature reactions to the Inoculation.

Presence of the P. Bigeminum in Salted Cattle.—As first demonstrated by Theiler (and mistaken by Prof. Koch for the parasite of African Coast Fever), the ring shaped stage of the P. Bigeminum is almost invariably to be met with in young animals from eleven to seventeen days after inoculation with blood from a recovered animal, but I have not been so successful in may search in the case of older animals.

Lung-sickness.

Doses sent out, 15,415.

The method of preparing this vaccine is through the medium of a calf; the clean exudate from the interlobular Lymphatics of the Lung in a good case of the disease is introduced under the skin of the dewlap of a calf, preferably from a district where Pleuro-pneumonia is unknown; in from ten to twelve days a large œdematous swelling appears at the seat of inoculation, this consists of areolar and subcutaneous connective tissue, the spaces of which are distended with clear straw yellow fluid, which coagulates on exposure to the air.

The calf is killed and thoroughly bled, and after careful aseptic precautions this fluid is removed and added to two-thirds of its bulk of a mixture of equal parts of glycerine and water, and packed up in small tubes. This Vaccine is never sent out if over thirty days old. The only objection to this method of providing virus is its uncertainty; given the same natural virus and two to all appearances identical calves, it is more than likely that one will shew the required œdematous enlargement, while at the seat of inoculation in the other will be found a hard firm swelling, which in time breaks down and discharges. I have endeavoured to get to facts about this, and it seems as if agents of which we are yet unaware have to do with this reaction, and that the constitution of the calf has as much to do with it as the virus itself.

Universally successful results have followed the use of this Vaccine for Lungsickness, but, due to your wishes, I am preparing to send out the Pleuro-pneumonia Cont. Culture Vaccine in use on the Continent of Europe.

The method adopted is by cultivation in "Martials" Bouillion, filtering through Porcelain, adding Serum and incubating.

I am not in a position to speak of the efficacy or value of this Vaccine as yet

Malarial Fever in Sheep (Bekziekte).

Serum Issued, 3,300 Doses.

This flock has been increased in numbers, and the vaccine is the simultaneous inoculation of serum from a fortified animal, mixed with virulent blood preserved by the addition of Glycerine.

Experimentally this method gives excellent results; how far they are borne out in practice we are not in a position to say.

Mallein.

Doses sent out, 11,100.

This is prepared in the usual manner, and standardised that 1 c.c. kills a guinea-pig.

Sponsziekte (Blackquarter).

Doses sent out—Powder, 990; do., Single Cord, 1,550, Blacklegine; do., Double Cord, nil, Blacklegine.

Some failures have been reported in the use of the single cord form of Blacklegine; this, successful users assert, is due to want of care and skill in the inoculation, the part, they say, must be *well rubbed* after the insertion of the cord to insure satisfactory results. This is confirmed by M. M. E. Leclainche and H. Vallée's experiments, *vide* p. 14 of pamphlet on Anthrax and Quarter-evil, "Agricultural Journal," No. 2, Vol. XVIII., page 70.

Summary of Vaccines Issued.

	Doses.	Cost. £	s.	d.
Lungsick Vaccine	15,415	192	13	9
Redwater	912	26	11	0
Bluetongue Serum	3,300	33	0	0
Mallein	11,100	185	0	0
Blackquarter, Cord	1,550	46	10	0
Do., Powder	990	28	0	0
Anthrax, 35 Tubes	–	17	10	0
Representing a value of		£529	4	9

Value of Stock in Veterinary Laboratory.

	£	s.	d.
Cattle—			
Oxen	300	0	0
Calves	25	0	0
Cows, six Cape, charged at £22 10s. 0d.	135	0	0
Horses, Carts, Harness, etc.	150	0	0
	£610	0	0

The oxen are at face value, their actual value as producers of Redwater Vaccine are much higher.

Number of Specimens examined from August, 1906, to December 31st, 1906.

During that period thirty-one specimens have been sent in to the Laboratory, examined and reported on, and varied from Blood Smears to the Body of an Ostrich Chick.

WILLIAM ROBERTSON, M.R.C.V.S.,
Director.

Veterinary Laboratory,
Grahamstown, 5th February, 1907.

APPENDIX III.

REPORT of the Chief Inspector of Sheep for the Year 1906.

I have the honour in submitting my report on the working of the Scab Acts and Regulations for the year 1906, to state that the improvement effected during the previous twelve months has been in most Divisions more than maintained. In certain parts we have suffered slight reverses, which, whilst disappointing, are after all only what might be expected, and are bound to occur until our present legislation is so improved as to afford protection for clean areas; bring more pressure to bear on the indolent farmer, and enforce the destruction or fencing of infected kraals and sleeping places.

Generally speaking there has been a marked decrease in scab, and some Divisions which were fairly free from disease at the close of 1905 are now declared to be quite clean. The reports forwarded by the Inspectors show that whereas, on the 31st December, 1905, the percentage of scab in the Colony was 4·84 per cent., this at the close of this year had been reduced to 2·88 per cent., or a decrease of almost two per cent.

On the 31st December, eleven Divisions, containing 1,147,181 sheep and goats, were reported by the Inspectors to be quite free from scab. For the corresponding period in 1905 there were ten Divisions, including 984,189 sheep and goats, which were declared clean. Five of these last-mentioned Divisions—Cathcart, George, Knysna, Stockenstroom and Tarka—are not included among the clean areas, as slight outbreaks have occurred, owing in nearly every case to the introduction of infected sheep, or the use of old kraals and sleeping places.

The Divisions of Barkly West, Herbert, Humansdorp, Kimberley, Paarl and Victoria East have, however, been added to the list of clean areas. The improvement already mentioned is further emphasized by the following comparative tabular statement, shewing the percentages of scab at the close of the years 1905 and 1906, viz.:—

Comparative Return shewing prevalence of Scab (omitting Bechuanaland and the Native Territories), 1905 and 1906.

Year.	Free from Scab.*		Under 1% of Scab.		1% and under 3%.		3% and under 5%.		5% and over.	
	No. of Divisions.	No. of Stock.	No. of Divisions.	No. of Stock.	No. of Divisions.	No. of Stock.	No. of Divisions.	No. of Stock.	No. of Divisions.	No. of Stock.
*1905	10	984,189	18	4,402,760	12	3,344,645	8	1,977,262	23	5,500,500
†1906	11	1,147,181	20	5,689,837	23	6,496,793	9	1,767,036	11	3,415,942

* 4 Divisions omitted. † 1 Division omitted.

From the above it will be seen that in 1906 there were only eleven Divisions in which more than 5 per cent. of the stock were infected as against 23 in 1905.

During the year, the reports shew a decrease of disease in 42 Divisions, a slight increase in 16, whilst in 16 the percentage is about the same—that is—the stock have remained clean or practically free from scab.

The Divisions in which the most infection exists at the present time, are:—Beaufort West, Calvinia, Carnarvon, Clanwilliam, Colesberg, Hopetown, Molteno, Swellendam, Uitenhage and Victoria West, in which parts the percentage of scab varies from five and one half in Clanwilliam, to nineteen and one half in Carnarvon; the average percentage in the ten Divisions being slightly over nine and one half.

One more satisfactory proof of the advance that has been made is the fact that in many parts the flocks have not only been cleansed, but have remained clean for considerable periods. As an example I might quote the Division of Albert, in which the percentage of scab at the close of 1902 amounted to over 41 per cent. In this Division a marked improvement has been effected during the past few years. In one area of the Division, among 175 stock owners, 108 have kept their flocks free from scab, for periods ranging from one to five years. In another quarter of the same division 119 farmers have had clean sheep for from twelve months to four years. This progress is mainly due to the co-operation of the farmers, systematic dipping and the destruction of old infected kraals.

The figures I have quoted are instructive, for they show what can be effected when farmers and Inspectors combine in the endeavour to eradicate scab, and I have no hesitation in stating that if this assistance had been generally accorded from the time the Act of 1894 was first enforced, the flocks throughout the country would have been in a much healthier state at the present time.

As I have repeatedly pointed out in former reports—areas and Divisions may be freed from scab, but we have no adequate safeguard that they will remain clean for any time. During last winter two flocks of sheep infected with scab were introduced into Komgha—a Division which had been clean for years. These introductions might have been attended with very serious consequences had it not been for the prompt and effective action of the local Inspector. This is but one of the many instances which could be cited, but it serves to show that when an Inspector has cleaned all the stock in his area, he must ever be on the alert to guard against the introduction of infected sheep. At any time through the leniency or carelessness of an Inspector, scab may be introduced into a clean Division and the work of many years undone.

Until stock owners realise the injury caused by scab, to a greater degree than many of them at present appear to do, we will never make the progress which should be attained. Dilatory methods of dipping, and neglect to take reasonable precautions to keep the flocks clean, are responsible for more outbreaks of scab than many people are aware of. Familiarity, it would seem, has to a certain extent bred contempt for the disease, and numerous stock owners still maintain that scab is bound to appear with every drought or indifferent season. I can only hope that in their own interests, farmers will commence to agitate for the cancellation of the liberal privileges embodied in our Acts for the removal of infected sheep, and for greater pressure to be brought to bear on the indolent and careless owner. Until restrictions are placed on the removal of scabby sheep, and due protection afforded to the careful farmer, we will never be able to make the progress which will correspond with the expenditure at present incurred.

The annual cost of administering the Scab Acts and Regulations amounts to over £80,000, and yet, notwithstanding the fact that this large outlay is devoted to the endeavour to eradicate scab, we have failed to cleanse the flocks of the Colony. Those who continue to cultivate the disease, are in a great measure responsible for the amount expended, for the farmer who attends to his stock needs no pressure to induce him to clean his flocks; should an outbreak of scab occur, he takes the necessary steps in his own interest as well as of his sheep, upon which he depends for his income. The number of those who are opposed to Scab legislation is, I am pleased to state, decreasing every year, but I wish to emphasize the fact that if farmers would only co-operate with the Inspectors, and render our officers due support in the performance of their duties, the expenditure now involved would be greatly reduced in a short time.

Our Scab Acts require amending in two ways. First,—If a farmer will continue to breed scab, he should be made to pay for the privilege of doing so. Pressure could be brought to bear on this class of stock owner in the following manner: The first licence or order to cleanse should be granted free of cost, if scab still exists in the flock at the expiration of the period allowed, a renewal should be issued and a fine imposed of a certain sum for every sheep or goat in the flock, which amount should be doubled for every subsequent extension of the licence.

If this system was adopted we would in a short time have very little scab to contend with, as the indolent farmer would soon awake to the fact that he must either clean his stock, or abandon sheep farming for some more lucrative employment. The present legislation, which empowers the Inspector to carry out what the owner has neglected to perform, involves the retention of a large staff of Inspectors, as well as the appointment of Assistants to undertake the supervision of dipping which the Inspector is unable to attend to. This all means money, and renders it a matter of impossibility to reduce the expenditure to any appreciable extent. Our Scab Acts are in a great measure to blame for the large staff of Assistants and Inspectors which it is necessary to maintain, and until such time as the onus of cleansing is cast upon the farmer, I do not see how any saving in the vote can be expected. The argument is frequently used that in some parts stock can not be dipped on account of drought and poverty, and that thus the farmers in these parts have a valid excuse for the existence of scab in their flocks. This I know is the opinion held by many, but it is one with which I am unable to agree, It is only natural that, when sheep are impoverished and grazing deficient, if scab appears it will spread more rapidly than if the conditions were favourable, but the farmer who attends to his stock and recognises that in his sheep he has a valuable asset which require all the care and attention he can bestow upon them, will anticipate the evil time and make such efforts that when the worst comes his flocks will be in a healthy state to weather the storm.

The careless man allows his stock to deteriorate, and instead of having his flocks in a clean state, the unfortunate animals spend half the day and night in a vain attempt to alleviate the irritation caused by the scab insect. This class of farmer is mainly responsible for the large expenditure at present incurred, and such a man will never cleanse his sheep even in the most favourable season unless pressure is brought to bear upon him, as I have already indicated.

The second point is that the removal of infected sheep should be prohibited and a heavy penalty provided for every contravention. In the Act of 1894, there are four sections to which I wish to draw attention, and which deal with the removal of sheep. These are Clauses 26, 37, 38, and 41. Section 26 deals with the removal of clean sheep, and under its provisions an owner can issue a pass for the removal of his stock to any part of the Colony if his sheep are clean. I regret to state that the liberal conditions of this clause are at times seriously abused and, not infrequently, infected sheep are removed under the protection of the permit mentioned.

On one occasion at a public sale, I found a scabby sheep among a flock which was offered for auction, and which was protected by the pass issued by the owner. When the remainder of the flock on the farm was examined, a large number of infected animals were found. The owner in this case had selected all the sheep which appeared to him to show no visible signs of disease, but had overlooked the one sheep which was discovered with the infection. A fine of £2 was the punishment awarded. If Section 26 is to remain as part of the Act, the penalty for contravention should be raised, and a fine imposed which will deter owners from moving any but sheep which are absolutely free from scab.

Sections 37, 38 and 41 govern the removal of infected sheep, and are responsible for the spread of the disease in a very disastrous manner. If these very liberal provisions were withdrawn a further inducement would be offered for farmers to cleanse their sheep and maintain them in this state. At present the owner who is too negligent to free his flock from disease, knows that by once dipping or even handdressing the same, he can always obtain the necessary permit to remove his stock. Why then, he argues, should he be put to more expense and trouble than is absolutely necessary. An apology is due for referring so frequently in my reports to these matters, but they are subjects of vital importance to the work of scab eradication, and until the necessary alterations are made we can expect but little real and lasting progress.

As indicated in my annual report for 1905, a certain reduction has been made in the number of the Inspectors with a corresponding decrease in the expenditure. In Albert, Aliwal North, Colesberg, Middleburg, Glen Grey, Peddie and Stutterheim, the staff has been reduced, and whereas 22 Inspectors were required to administer the Acts in these parts, there are now but 15.

We have, however, reached the limit at which reductions can be made without impairing the efficiency of the work, and I do not see my way clear to recommend any further reductions for some time to come. In certain Divisions such as Beaufort West, Calvinia, Carnarvon, Clanwilliam, Fraserburg and Namaqualand, the need for additional Inspectors is urgently felt and at least six extra men are required; if these are appointed there would be some prospect of scab being combated in a proper manner. At present the Inspectors are quite unable to do efficient work owing to the great extent of their areas.

During the year several experiments have been carried out with a view of determining for what period a kraal may be considered a source of infection after scabby stock have been taken from it. Some of the tests have not been completed, and as it will be as well to embody an account of all the experiments in one report, these will have to stand over until next year. Some of the sheep dips most generally used in the Colony have also been tested on newly shorn sheep, as well as on animals carrying three and six months' fleeces; the object in view being to ascertain what damage is caused to the wool by the use of these ingredients. These dippings have been completed, but as the sheep have not yet been clipped, and the wool sent away for manufacturer's report, the result of the experiments will be included in my next report.

The contraventions of the Scab Acts reported during the twelve months total 850, the convictions 723, and the penalties amount to £1,979 11s. 6d., or an average fine of £2 14s. 9d. The numbers for the preceding year being 837 prosecutions, 724 convictions, and an average penalty of £2 13s. 4d.

The figures forwarded by the Inspectors at the close of the year when compared with those for 1905, show an increase of sheep and goats of almost two millions, the correct figures being 16,655,540 sheep and goats on the 31st December, 1905, and 18,516,789 at the close of the year. As the latter total does not include the Division of Mossel Bay, in which part there are about 130,000 sheep and goats, the increase I have quoted will be fairly correct.

The total number of lambs and kids reared amounted to 5,361,884, more than half a million in excess of the total for the preceding year. In 30 Divisions the lambing is reported as good, in 32 fair, whilst in 12 it is said to have been bad. The total number of sheep lost from disease and other causes is about 60,000 less than last year.

In Bechuanaland but little progress has been made, as the four Inspectors appointed during the year are quite unable to cope with the work, which requires at least 12 men to perform it in anything like an efficient manner. The reports received at the close of the year shew over 600,000 sheep and goats, but a large portion of some areas has yet to be examined. I trust that the additional men I have asked for on the Estimates will be authorised, when I have every hope that a decided advance will be made in the eradication of scab in this part of the country.

In the Native Territories, considerable progress has been made, especially in Griqualand East and Pondoland. In Tembuland and the Transkei there is, I regret to state, great room for improvement. At the close of the year the following districts were declared to be free from scab:—Idutywa, Elliotdale, Mount Currie, Matatiele, Mount Ayliff, St. John's, Lusikisiki and Flagstaff, containing in all 806,883 sheep and goats. In Tembuland and the Transkei the percentage of infected sheep at the close of 1905 amounted to 3·83 per cent., on the 31st December last this had been reduced to 2·90 per cent.

In Griqualand East the corresponding figures were 0·67 per cent. in 1905, and 0·25 per cent. on the 31st December. Pondoland shews the most marked improvement, for whereas on the 31st December, 1905, the percentage of scab was slightly over 35 per cent., at the close of the year the Inspectors reported but 1·55 per cent. as infected.

In Tembuland and the Transkei, in the districts of Nqamakwe, Tsomo, Umtata, Willowvale, Engcobo and Elliot, the state of the stock is anything but satisfactory, and during the last winter a large number of flocks in these parts were badly infected with scab. It is hoped that a considerable improvement will be effected during the course of the coming year, as until these districts are cleansed it will be impossible to safeguard Griqualand East from re-infection.

The contraventions of the Regulations for the twelve months totalled 882, the convictions 790, and the fines imposed amounted to £848 12s. 6d., or an average penalty of £1 1s. 5d. The figures for the preceding year were: 1,003 prosecutions, 793 convictions, and an average fine of £1 1s. 2d.

The increase of stock has been exceptionally bad. In two districts it is reported as good, in 11 as fair, and in 15 as bad. The number of lambs and kids reared amounted to 615,871, which when compared with the preceding year shows a decrease of 400,000. The losses from disease and other causes totalled 392,830, or 110,000 in excess of last year.

I cannot conclude my report without expressing my thanks to those of my Assistants, and of the Sheep Inspectors who have done so much to effect the reduction in the total of infected flocks. I know their efforts often pass unnoticed and are not duly appreciated, but ultimately they are bound to bear fruit. I sympathise with those who have often seen their labours undone and nullified, owing to the carelessness of others, but the hope is expressed that they will not be discouraged by what may seem to be failure, but which in many cases is the forerunner to success. Tact and patience are required to convince farmers that the law is not oppressive, and that the Acts have been framed for the purpose of eradicating scab, improving the wool, and keeping the sheep in a healthy state.

If these ideas can once be impressed and forced home on the farmer, we may be certain of the support of every stockowner, and with this, and the improvement of the law, the time cannot be far distant when the flocks of the country will be freed from scab.

ALLEN G. DAVISON,
Chief Inspector of Sheep.

Office of the Chief Inspector of Sheep,
Department of Agriculture,
26th February, 1907.

Return of Small Stock in several Districts of Cape Colony proper on 31st December, 1906.

DIVISION.	No. of Flocks.	Number of Sheep and Goats.				Total.	No. of Flocks free from Scab.	No. of Sheep and Goats in same.	No. of Flocks under order to cleanse.	No. of Sheep and Goats in same.	Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.								
		Wooled.	Cross Bred.	Angora.	Others.							
Aberdeen	814	20.849	115,309	292,127	16,312	444,597	801	439,843	13	4,754	119,492	1,433
Albany	640	55,469	91,838	2,309	35,488	185,104	623	178,082	17	7,022	54,062	8,189
Albert	959	371,415	58,440	26,674	4,525	461,054	955	458,766	4	2,288	129.880	13,118
Alexandria	234	1,694	13,030	...	6,902	21,626	234	21,626	...	...	7,225	430
Aliwal North	764	299,318	59,146	24,921	3,213	386,598	736	364,832	34	21,766	104,237	15,200
Barkly East	863	561,413	9,875	8,749	2,391	582,428	857	577,169	6	5,259	164,452	59,525
Barkly West	1,522	78,552	60,799	17,987	183,430	340,768	1,522	340,768	...	...	83,881	14,923
Bathurst	344	...	5,150	...	13,035	18,185	343	17,865	1	320	7,322	3,220
Beaufort West	748	144,673	197,153	88,236	80,647	510,709	701	467,995	47	42,714	212,402	10,675
Bedford	795	155,736	71,542	76.991	17,018	321,287	789	318,508	6	2,779	94,879	...
Bredasdorp	335	163,716	2,712	6,815	16,960	190,203	322	182,025	13	7,178	55,052	2,902
Britstown	347	84,116	122,882	14,455	32,739	254,192	339	247,380	8	6,812	84,025	200
Caledon	323	173,707	1,635	...	10,260	185,602	314	180,185	9	5,417	46,448	...
Calvinia	543	75,931	144,191	850	61,250	282,222	500	256,409	43	25,813	58,768	47,990
Cape	99	30,750	2,014	...	2,010	34,774	95	33,766	4	1,008	15,064	329
Carnarvon	892	44,144	333,547	11,108	71,111	459,910	757	370,649	135	89,261	217,526	8,200
Cathcart	602	289,650	2,120	13,062	2,722	307,554	600	307,428	2	126	58,127	9,547
Ceres	307	96,894	38,266	...	28,753	163,913	300	161,365	7	2,548	59,903	5,810
Clanwilliam	385	23,698	19,763	288	65,638	109,387	366	103,439	19	5,948	25,271	5,078
Colesberg	597	277,674	64,700	21,791	10,247	374,412	567	351,208	39	23,204	54,577	17,531
Cradock	1,382	181,763	226,132	255,801	13,700	677,396	1,357	664,615	25	12,781	223,644	14,964
East London	1,769	1,834	1,320	...	52,927	56,091	1,769	56,091	...	...	4,300	6,910
Fort Beaufort	586	93,700	32,551	19,033	26,183	171,467	584	170,327	2	1,140	32,847	...
Fraserburg	616	22,016	283,986	1,406	73,711	381,119	597	364,987	19	16,132	112,199	4,200
George	251	49,938	2,578	821	23,193	76,530	248	75,411	3	1,119	11,901	3,800
Glen Grey	3,696	152,486	2,051	27,201	86,220	267,958	3,673	265,208	23	2,750	47,883	12,706
Graaff-Reinet	677	121,076	98,408	132,284	35,258	387,026	673	383,650	4	3,376	142,554	2,824
Hanover	318	78,463	66,202	35,224	11,989	191,878	313	188,913	5	2,965	70,795	700
Hay	949	68,924	151,428	17,976	192,397	430,724	945	427,955	4	2,770	152,475	34,663
Herbert	749	40,174	100,297	11,881	89,225	241,577	749	241,577	...	...	76,600	10,880
Herschel	2,261	111,627	4,796	35,647	50,227	202,297	2,254	201,711	7	586	36,416	23,963
Hopetown	399	57,693	179,940	10,183	26,905	284,721	379	266,623	20	18,098	99,360	3,385
Humansdorp	512	69,099	11,860	2,965	22,481	106,405	512	106,405	...	...	27,000	5,000
Jansenville	1,286	2,800	67,969	458,420	92,756	621,945	1,273	615,432	13	6,513	173,100	2,010
Kenhardt	607	7,981	215,471	798	96,670	320,920	603	320,442	4	478	84,295	14,468
Kimberley	356	25,670	42,230	11,050	56,300	135,250	356	135,250	...	...	27,328	1,000
King William's Town	5,978	208,334	8,842	507	164,065	381,748	5,975	380,887	3	861	77,916	30,853
Knysna	122	18,183	431	421	4,089	23,124	120	22,987	2	137	4,000	1,227
Komgha	1,200	30,539	14,640	...	42,768	87,947	1,200	87,947	...	...	24,275	8,000

Return of Small Stock in several Districts of Cape Colony proper on 31st December, 1906—*continued.*

DIVISION.	No. of Flocks.	Wooled Sheep.	Cross-bred Sheep.	Angora Goats.	Other Goats.	Total.	No. of Flocks free from Scab.	No. of Sheep and Goats in same.	No. of Flocks under order to cleanse.	No. of Sheep and Goats in same.	Increase of Lambs and Kids.	Losses through Drought and Disease.
Ladismith	152	...	8,000	...	92,000	100,000	150	99,497	2	503	13,200	6,000
Malmesbury	805	207,775	7,425	...	43,725	258,925	790	254,801	15	4,124	74.763	8,252
Middelburg	474	106,436	112,423	32,494	27,918	279,271	467	275,131	7	4,140	79,327	5,754
Molteno	387	119,391	18,825	18,594	675	157,485	371	144,741	16	12,744	42,465	3,695
Mossel Bay	...	Figures not	obtainable	on account	of change	in the staff.	...	...	...	...	...	...
Murraysburg	339	46,699	51,980	118,712	14,213	231,604	338	230,994	1	610	83,997	1,195
Namaqualand	891	2,244	108,953	...	79,428	190,625	840	183,174	51	7,451	76,682	26,995
Oudtshoorn	672	212	23,458	94	113,160	136.924	667	135,576	5	1.348	36,000	1,050
Paarl	152	26,974	2,908	...	8,947	38,829	152	38,829	...	...	10,510	910
Peddie	1,531	36,907	1,505	...	76,344	114,756	1,517	112,090	14	2,666	17,546	...
Philipstown	388	112,671	125,718	24,102	32.806	295,297	377	286,867	11	8,430	107,529	3,540
Piquetberg	489	83,796	5,751	...	46,149	135,696	474	129,091	15	6,605	33,681	1,330
Port Elizabeth	92	45	1,000	10	1,615	2,670	92	2,670	...	...	810	35
Prieska	487	33,852	224.279	7,499	79,180	344,810	471	328,700	16	16,110	119,168	8,107
Prince Albert	471	43,931	110,692	16,256	98,716	269.595	466	265,311	5	4,284	121,109	2,487
Queenstown	1,534	418,990	30.899	64.319	14.808	529,016	1,532	528,025	2	991	147,248	2,496
Richmond	380	107,270	49,023	43,151	19,626	219,070	364	208,235	16	10,835	81,631	1,596
Riversdale	852	178,560	4,055	3,119	112,116	297,850	847	296.539	5	1,311	63,104	4,500
Robertson	305	1,530	31,500	...	70.400	103,430	290	99,273	15	4,157	21,500	4,000
Somerset East...	1,339	92,215	211.664	249,270	44,588	597,737	1,314	581,512	25	16,225	192,435	19,470
Stellenbosch	58	7,813	295	264	4,538	12,910	58	12,910	...	...	2,870	398
Steynsburg	517	116,598	54,869	21,299	9,206	201,972	508	198,102	9	3,870	68,338	6,100
Stockenstrom	653	76,825	11,820	10.867	24.860	124,372	650	123,551	3	821	38,161	2,300
Stutterheim	729	197.882	5.635	615	15,684	219,816	727	218,195	2	1,621	38,386	10,148
Sutherland	358	40,002	195,335	...	46,171	281,508	351	278,412	7	3,096	77,253	1,500
Swellendam	542	139,858	14,622	84,817	52,975	292,272	469	269,800	73	22,472	88,618	4,021
Tarka	801	255,967	18,459	52,609	3,478	330,513	798	328,877	3	1,636	93,389	9,656
Tulbagh	95	8,585	1,221	...	7,173	16,979	90	16,257	5	722	4,203	60
Uitenhage	924	13,417	21,959	137,273	47,375	220,024	860	199,331	64	20,693	29,966	...
Uniondale	250	34,322	10,567	39,155	35,048	119,092	242	116,244	8	2,848	24,015	540
Van Rhynsdorp	337	16,715	76.559	...	63,098	156,372	328	154,358	9	2.014	38,868	7.791
Victoria East	1,584	46,315	6,721	1,430	48,642	103.108	1,584	103,108	...	...	22,000	8,000
Victoria West	504	104,366	167,029	29,968	36,839	338,202	462	307,875	42	30,327	123,212	5,404
Willowmore	809	11,448	59,284	344,598	48,504	463,834	795	455,076	14	8,758	126,975	6,309
Wodehouse	1,508	468,574	17,366	29,864	5.660	521,464	1,466	514,709	42	6.755	143,587	47,363
Worcester	249	22,260	57,412	560	49,880	130.112	247	129,127	2	985	27,857	1,224
	57,485	7,472,144	4,774,465	2,958,920	3,311,260	18,516,789	56,449	17,982,714	1,036	534,075	5,361,884	628,079

Returns for the year ending 31st December, 1906.

BECHUANALAND.

DIVISION.	Number of Flocks.	Number of Sheep and Goats.				Total.	No. of Flocks free from Scab.	No. of Sheep and Goats in same.	No. of Flocks under order to cleanse.	No. of Sheep and Goats in same.	Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.								
		Wooled.	Cross Bred.	Angora.	Others.							
Gordonia	758	...	150,926	950	102,378	254,254	756	253,817	2	437	65,062	...
Kuruman	580	8,862	37,890	825	72,015	119,592	547	113,768	33	5,824	35,464	2,250
Mafeking	1,205	3,441	38,275	4,032	59,923	105,671	1,153	99,537	52	6,134	40,401	645
Vryburg	570	40,094	23,518	41,363	25,603	130,578	540	121,821	30	8,757	...	...
	3,113	52,397	250,609	47,170	259,919	610,095	2,996	292,938	117	10,068	140,927	2,895
TRANSKEI.												
Kentani	1,716	50,505	126	...	37,128	87,759	1,711	85,561	5	2,198	6,648	4,666
Butterworth	1,302	41,741	...	...	22,027	63,768	1,295	63,120	7	648	13,933	14,926
Nqamakwe	2,837	189,408	...	...	60,916	250,324	2,728	231,545	109	18,779	31,163	21,001
Tsomo	1,373	46,503	...	...	34,566	81,069	1,342	77,595	31	3,474	3,324	9,710
Idutywa	1,752	133,116	...	62	38,104	171,282	1,752	171,282	...	...	31,740	14,610
Willowvale	2,515	37,799	...	...	52,309	90,108	2,501	87,699	14	2,409	21,184	12,060
	11,495	499,072	126	62	245,050	744,310	11,329	716,802	166	27,508	107,992	76,973
TEMBULAND.												
Elliotdale	1,739	4,404	...	...	29,025	33,429	1,739	33,429	...	...	7,864	1,276
Mqanduli	2,267	60,483	3	97	46,450	107,033	2,260	106,141	7	892	21,151	11,557
Umtata	2,276	159,903	...	...	50,245	210,148	2,234	206,173	42	3,975	20,949	37,592
Engcobo	2,937	154,922	...	807	76,196	231,925	2,874	225,722	63	6,203	42,834	40,770
St. Mark's	2,649	130,428	...	660	82,327	213,415	2,643	213,051	6	364	31,091	44,382
Elliot	508	126,457	4,041	19,855	3,973	154,326	483	145,155	25	9,171	27,872	9,980
Xalanga	884	39,613	...	16,500	17,521	73,634	857	70,246	27	3,388	7,010	5,861
	13,260	676,210	4,044	37,919	305,737	1,023,910	13,090	999,917	170	23,993	158,771	151,418
Transkei	11,495	499,072	126	62	245,050	744,310	11,329	716,802	166	27,508	107,992	76,973
Tembuland	13,260	676,210	4,044	37,919	305,737	1,023,910	13,090	999,917	170	23,993	158,771	151,418
	24,755	1,175,282	4,170	37,981	550,787	1,768,220	24,419	1,716,719	336	51,501	266,763	228,391

Return for the Year ending 31st December, 1906.

GRIQUALAND EAST.

DIVISION.	No. of Flocks.	Number of Sheep and Goats.				Total.	No. of Flocks free from Scab.	No. of Sheep and Goats in same.	No. of Flocks under order to cleanse.	No. of Sheep and Goats in same.	Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.								
		Wool.	Cross Bred.	Angora.	Others.							
Mount Currie	630	213,111	1,590	3,265	9,065	227,031	630	227,031	...	...	40,967	17,283
Umzimkulu	1,885	57,652	15,014	185	48,422	121,273	1,882	122,073	3	200	6,350	2,300
Matatiele	1,354	185,193	634	4,263	28,987	219,077	1,354	219,077	...	...	54,877	20,450
Mount Fletcher	1,360	43,061	631	37,163	15,256	96,111	1,358	95,893	2	218	36,229	11,588
Mount Frere	2.443	62,920	...	1,400	63,190	127,510	2,441	127.079	2	431	16,348	14,795
Mount Ayliff	459	17,256	276	637	23,578	41,747	459	41,747	...	...	20,873	...
Qumbu	2,088	63,562	...	2.122	44,083	109,767	2,082	108,610	6	1.157	19,975	23,908
Tsolo	2,323	95,539	11	798	55,645	151,993	2,320	151,391	3	602	48,126	27,563
Maclear	416	57,911	2,862	10,529	9,822	81,124	414	80,763	2	361	15,549	3,544
	12,958	796,205	21.018	60,362	298,048	1,175,633	12.940	1,172,664	18	2.969	259,294	121,431

PONDOLAND, EAST AND WEST.

Ngqeleni	2,424	41,406	...	...	40,776	82,182	2,423	82,120	1	62	13,777	3,900
St. John's	589	678	331	...	10,141	11,150	589	11,150	...	...	2,020	200
Lusikisiki	2.536	17,021	...	...	43,781	60.802	2,536	60,802	...	...	10,000	5,000
Bizana	1.875	20,575	...	...	30,471	51.046	1,723	44,827	152	6.219	...	...
Flagstaff	1,677	17,500	523	...	24,342	42,365	1,677	42,365	...	...	12,378	5,689
Tabankulu	2,185	41,806	...	...	50,439	92,245	2 180	91.943	5	302	15,434	7,920
Libode	1.983	59,165	...	...	55,268	114,433	1,980	113,945	3	488	36,205	20,300
	13,269	198.151	854	...	255,218	454,223	13,108	447,152	161	7,071	89,814	43,009

APPENDIX IV.

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TO THE REPORT OF THE GOVERNMENT ENTOMOLOGIST FOR THE YEAR 1906.

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REPORT of the Government Entomologist for the Year 1906.

In accordance with instructions, a report to shew merely the outline of the work accomplished is given, as was done last year, and as was then the case, no illustrations are provided for. Under this plan the detailed records of work are stored away in manuscript to be made use of as occasion may require for the compilation of special reports or articles to be published in the *Agricultural Journal* or other publication more appropriate for such matter than a Parliamentary document, as is the present report. The chief disadvantage of this arrangement is that the only regular Departmental channel which was open for the publication of purely technical papers and interim reports on technical work is now closed. The *Agricultural Journal* is available, it is true, but to publish details of experiments and matter of permanent value for reference rather than of momentary interest in it is really much more wasteful than to publish such in annual reports, since the circulation of the Journal is far larger and the proportion of its readers who keep permanent files certainly very much smaller. I understand that the exclusion of details and illustrations from the annual reports was to lessen the expense of printing in these years of financial depression, but such a policy once established is likely to be continued indefinitely, to the detriment of scientific work. In one way, the aims of the Department are purely practical. Yet the purely practical should be based on scientific accuracy, and to maintain this the officers should have every encouragement to blend research work with their routine duties. A suitable official channel for the publication of results is very desirable, and I hold that it is a mistake to restrict the annual report as is now being done, unless another and better channel is opened. Another officer of the Department has proposed that an independent publication, to contain technical matter only, and to circulate only in scientific circles, should be started by the Government, and I think his idea should receive very careful and sympathetic consideration. It seems to offer a way of preventing the wastage that is inseparable in publishing matter of permanent scientific value in official reports designed to be read primarily by members of Parliament, or in the *Agricultural Journal* designed for the presentation of opportune information to farmers.

STAFF.—The routine work of the Branch was much greater than in previous years because of new work undertaken, but owing to the continual appeals for strict economy in expenditure, it was done without increase in staff, a result accomplished chiefly by the curtailment of experimental research and visits amongst farmers for the purpose of instruction and demonstration. The staff consists of the Government Entomologist, two Assistants to Entomologist (R. W. Jack and T. F. Dreyer, B.A.) and one clerk stationed at Cape Town; and of the Eastern Province Entomologist (W. R. Dewar, B.Sc.) with an unqualified assistant (S. M. Wood) at Grahamstown. Mr. Jack has had the examination of fruit and plant imports through the port of Cape Town, and the direct supervision of the Animal Diseases Experiment Station at Rosebank as his special work, while Mr. Dreyer's principal work has been the inspection of nurseries. Mr. Dewar is entrusted with as much as practicable of the routine work of the Eastern Province. For special attention, he has studies on fruit flies, fruit-sucking moths, and certain other fruit pests; and he has to do the inspection of nurseries in a few districts. During the year he was also detailed to demonstrate the use of arsenite of soda for locust destruction in Aliwal North district, to investigate a serious tobacco trouble in the Kat River Valley, and to enquire into a paralytic trouble amongst small stock on the Fish River Rand and elsewhere, alleged to be due to the attack of a tick. When the post of Eastern Province Entomologist was created, it was intended to have the incumbent submit an annual report for publication, but the idea has been abandoned for the present in order to economise the printing vote. A short monthly report is received, and serves to keep the head office informed as to the progress of the work.

CORRESPONDENCE AND PUBLICATIONS.—The system of recording and filing correspondence now used in the office renders it impractical to estimate closely the extent of the ordinary correspondence, but it is thought to amount to about fifteen hundred incoming letters, and to a somewhat larger number of outgoing ones, without taking into account circulars, and a voluminous correspondence exclusively on locusts. The press copy book has been dispensed with, a "carbon" copy of each outgoing letter now being taken on the typewriter. The copy is attached to the letter to which it refers, and in general all correspondence is filed under a sequence number given to the writer of the incoming letter. Thus all of any one man's correspondence is kept together regardless of date or subject, except in certain cases when for convenience the correspondence on particular subjects is kept together. A card index of the correspondents shows the subject of each letter, the dates received or despatched, and where filed, and by means of cross-indexing it is easy at any time to turn to all the letters of special interest on any subject. The system was started in full working on July 1st and has proved very satisfactory. Not only is it much easier to refer to filed correspondence, but the initial cost in time of recording, filing and indexing, is less than before, and this has materially assisted in enabling us to struggle along for the present without increased clerical assistance. Whenever possible, information in reply to enquiries is in large part given by printed accounts. These accounts are chiefly reprints of articles which have appeared in the *Agricultural Journal*, and they cost little more than the paper on which they are printed. Articles as below tabulated were contributed during the year to the Journal, and all marked with an asterisk were reprinted.

"Agricultural Journal" Contributions.

Title.	Issue.	Pages.
		Vol. xxviii.
*Locust Birds and Locust Poisons	March ...	364–366
Brazil Fruit Fly Parasites	„ ...	303
Do. do.	April ...	538–540
*Ticks and African Coast Fever	May ...	634–654
*Tobacco Wilt in Kat River Valley	June ...	784–803
*Chrysanthemum Rust	„ ...	808–809
		Vol. xxix.
*Snails and Caterpillars in Lucerne; Notes	July ...	14–16
*Zwart Roest or Anthracnose of the Vine	„ ...	29–35
*Swabbing Vines for Anthracnose	August ...	152–153
Red Scale Parasite; Note	„ ...	153–154
*Arsenate of Lead	„ ...	223–228
Insect Pests affecting Fruit Trees	October ...	500–511
*The Locust Invasion	November...	596–600
*Black Peach Aphis. Remedy; Note	„ ...	607

Other publications of the year that are available for distribution are:

Title.	Length.
Enforcement of the Nurseries Act	10 pages.
Instructions for Fumigating Nursery Stock	14 pages.
Fumigation of Plants in Nursery Rows	6 pages.

These were translated into Dutch at the office, and have been of essential service in connection with the Nurseries Act. Still another publication available is a newspaper reprint of a translation into Dutch of a lecture on the Codling Moth, delivered before the Wellington Fruit Growers' Association in September.

PLANT AND FRUIT IMPORT REGULATIONS.—The supervision of the over-sea Plant and Fruit Import Regulations, now one of the recognised duties of the writer, brings much work of an uninteresting routine nature. The provisions must be of inestimable value to the public by protecting the Colony from over-sea plant pests, but their benefit, not being tangible, is little realized by most people; and on the other hand private interests must be opposed frequently by decisions which to the parties concerned seem high-handed and quite unwarranted. Therefore the work brings more abuse than thanks. The regulations restrict introductions of all trees to small numbers, introduced by special permission, and their protective value is largely due to this limitation of imports and to the absolute prohibition of certain kinds of plants. The special permission required is withheld unless it appears that the plants desired can not be procured in the country or be raised from seed. Plants admitted are inspected for pests, and all woody kinds are treated to precautionary fumigation. Unfortunately, it is impracticable to have the inspections at all the four ports of the Colony at which plants are admitted conducted by qualified officers, owing to there being too little of the work to justify appointments for the duties alone, and because local men with the necessary qualifications, who could combine the duties with other work for a livelihood, are not to be found. However, fully ninety-five per cent. of the imports are through Cape Town and Port Elizabeth. The Superintendent of Parks at Port Elizabeth attends to the consignments which arrive at his port, and does the work conscientiously and well; and during the past year I have contrived to have an assistant from the office see nearly every consignment which entered Cape Town. In former years nearly all the fruit and the garden plants were left to the Surveyor of Customs, who for many years had given attention to the work.

The following table shews the number of cases of plants and fruits passed at the several ports. Bananas are not regularly examined now, and hence do not figure in the returns:—

Trees, Plants, Fruits, etc., inspected January to December, 1906.

Article.	Cape Town.	Port Elizabeth.	East London.	Mossel Bay.	Total.
	Cases.	Cases.	Cases.	Cases.	Cases.
Oranges	2,166	616	264	...	3,046
Lemons	594	606	19	...	1,219
Apples...	17,732	2,001	...	...	19,733
Other Fruits	30	85	...	...	115
Fruit Trees	21	21	1	...	43
Fruit Tree Stocks	17	3	4	...	24
Other Trees	7	...	...	...	7
Garden Plants	132	214	30	...	376
Greenhouse Plants	44	10	...	...	54
Bulbs, Plant Roots, etc.	159	102	10	...	271

Most of the fruit consignments were small. At Cape Town, 17 lots of citrous fruits, aggregating 627 cases; at Port Elizabeth, 7 lots, aggregating 331 cases; and at East London, 8 lots, aggregating 246 cases (or altogether about thirty per cent. of the total imports), were fumigated on account of scale insect infestation. One lot of 400 cases of apples from Tasmania was fumigated for the same reason; one lot of 100 cases from Madeira, and one of 11 barrels from Canada, were reshipped on account of Codling Moth; and one lot of 158 barrels from Canada, infected with *Fusicladium*, which was to have been re-shipped, was allowed by the owners to rot in cold storage. It may be mentioned that fruit importers were circularised to caution consignors against sending apples infested with Codling Moth, Fusicladium or other pest to South Africa, and that representations to the same end were made to the Australian and Canadian Governments. About 9,000 barrels arrived from Canada late in the year, and, thanks chiefly to the precautions we had taken, most of these were clean. The number imported appeared much in excess of the market requirements.

At Cape Town, 71 lots of plants, aggregating 126 cases; at Port Elizabeth, 64 lots, aggregating 167 cases; and at East London, 16 lots, aggregating 26 cases, were fumigated, in most cases merely as a precautionary measure. Aside from these, 18 lots, aggregating 37 cases, were fumigated at nursery destinations, in nearly every case under supervision. Prohibited plants, or restricted plants not covered by permits, were found in five consignments at Cape Town, six at Port Elizabeth, and three at East London, and were destroyed. In most cases the plants were conifers, *Vitaceae*, or fruit trees, consigned to the Colony for sale by auction. Only fifteen special permits for the introduction of restricted plants were issued during the year.

Nearly all of the parcels of plants introduced from over-sea by post were inspected in the Cape Town Office. The number thus examined and passed during the year was 112, of which 50 were fumigated in accordance with the regulation requiring this treatment in the case of all woody plants. About twenty lots, of which seven required fumigation, were attended to at other entrance ports for the parcel post. Parcel post consignments are now made up in London for through shipment to Port Elizabeth, East London, King William's Town and Kimberley, as well as Cape Town, but at each place inspection and fumigation is arranged for, at the sea-ports with the regular inspectors and in the inland towns with the curators of the local public parks.

ANIMAL DISEASES EXPERIMENT STATION.—This Station is for the joint use of the Veterinary and Entomological Branches in the investigation of animal diseases, particularly with reference to the transmission of inspection by insects. Up to the middle of the year the administration of the Vote for the Station lay with the Veterinary Branch, and Mr. Robertson, M.R.C.V.S., supervised the care of the premises and the animals. Until then a great deal of the work undertaken was joint work, Mr. Robertson being responsible for the veterinary and bacteriological phases and the writer for the entomological. This happy condition was rudely disturbed in August by the transference of Mr. Robertson to Grahamstown to take charge of the Veterinary Laboratory (the old Bacteriological Institute) there located, and with this change I was made responsible for the Station. The loss of Mr. Robertson's co-operation would have been heavily felt were it not that the funds available for the present financial year are so scanty that it has been impracticable to conduct experiments except on a very small scale. To save expense, the legitimate work was brought almost to a standstill during the winter, and the two stablemen retained made to spend most of their time in the erection of fencing and making of roads, and other quite necessary work which in the ordinary course would have been entrusted to the Public Works Department. Under Mr. Jack's able supervision the improvements were very well done at trifling expense, save, of course, in time, which should properly have been devoted to experimental research. A new road had become necessary, because the old exit was through private property, the privilege to cross which was being withdrawn.

The facilities of the Station continue to be made use of by the Veterinary Branch; it has had some diseased animals under observation throughout the year, and has conducted several series of poison plant feeding and dipping tests.

Our own work has been in continuance of the work of previous years on the transmission of African Coast Fever, Redwater, Heartwater, and Canine Malignant Jaundice by Ticks, and has been chiefly to confirm observations which seemed open to some doubt. Several cases of African Coast Fever were induced by *Rhipicephalus capensis*, a common Western Province species of cattle tick. A reliable series of tests affirmed the fact that ticks of the Bont species (*Amblyomma hebrœum*) fail to communicate Heartwater if their development from the time they feed on an infected animal to the time they are tested is at the temperature of the cooler months of the year. Control specimens, kept under similar conditions until the tests were made and then subjected to a temperature of about 93° F. for a few days, proved pathogenic. The prevalence of Heartwater in summer only where Bont ticks occur throughout the year is therefore elucidated. The Bont species is thus far the only one known to be inplicated with Heartwater. The related *Amblyomma marmoreum*, found occasionally on farm stock as larva and nymph, but as the adult, apparently confined to snakes and tortoises, was thoroughly tested during the year and failed to carry infection, as did the other species tried in previous years. Malignant Jaundice infected *Hæmaphysalis leachi* ticks were reared after considerable trouble, and are being used as the starting point of tests of other species of ticks now under way. Specimens of this species fed as larvæ on an infected dog when its blood swarmed with the parasite signally failed to infect healthy dogs when tested as nymphs in enormous numbers. Some pathogenic adults were sent to Cambridge University and there became the basis of some very valuable scientific work in connection with the disease.

Several small scale tests were made with the view of determining experimentally whether arsenical spraying and dipping affects ticks through the skin of the animal, that is, through the feeding, or through their own skins. The results showed conclusively that the ticks are poisoned independent of the skin of the animal. Moreover, they appear to show that a far larger proportion of the engorged female ticks are destroyed than is commonly supposed. These may seem unaffected when they drop, and even for two or more weeks afterward, and yet eventually succumb without leaving progeny. Most of the tests were with *Rhipicephalus australis* and *R. decoloratus*, we having great difficulty in getting Bont ticks. However, all of two lots of engorged Bont females, each lot consisting of a dozen specimens, succumbed to immersion in the ordinary strength of arsenite of soda dip; some burrowed into the ground as if to lay eggs. Nymphal ticks that are fully engorged seem more resistant than adults, and probably a large proportion of the larvæ and nymphs that leave the animal the day of dipping are not seriously affected.

NURSERIES INSPECTION AND QUARANTINE ACT.—The year under review was the first complete year of the operation of this Act, and it was unavoidable that what in years to come may be safely entrusted to assistants had to be done by me personally. Up to date 202 nurseries are registered, 156 as "general" and 46 as "local." By the provisions of the Act local nuserymen are not obliged to cleanse their stock of pests that may infest it, but are prohibited from sending stock away by railway or other public carrier, or having it removed by any means outside of the district. At present general nurserymen are obliged to fumigate all fruit trees before despatch, and also trees and plants of other kinds if certain scale and aphis pests are found thereon. Of the 202 nurseries, 26 are in Government forest plantations and 11 in public gardens. Vines only are sold by 47, and very little else than forest trees and hedge plants are sold by the 26 Government nurseries. Of the remaining 129, about 40 sell citrous trees, 62 deciduous fruit trees, and 47 chiefly miscellaneous florists' plants. With the exception of 14 in the Transkei, all of which are small and 12 of which are in Government forest plantations, and a few out-of-the-way forest nurseries in the Colony proper, the nurseries have been visited at least once. Most have been inspected twice, many three times, and not a few of the more important four to six or more times. They are scattered over thirty-three divisions of the Colony, exclusive of the Transkei, and several are remote from the railroad. One for the sale of fruit trees is on the Hogsback Mountain, twenty-four miles from the nearest railway station. One of the most insignificant is at Prieska, and though an hour was ample for its inspection, not less than three days sufficed for the return journey to the nearest point on the main line of railway. Owing to their utter lack of importance as pest distributors it is proposed hereafter to inspect some of the small out-of-the-way nurseries only when other duties duties take an inspector within easy reach of them.

No serious hitherto unrecognised pests were found in the inspection, but as was feared almost every nursery in which citrous trees were grown was infected with Red Scale (*Aspidiotus aurantii*), and almost every one in which apples were grown, with woolly aphis (*Schizoneura lanigera*). The Greedy Scale (*Aspidiotus rapax*), the Oleander Scale (*A. hederæ*), and the Brown Scale (*Lecanium hesperidum*) were found quite as widely. The Peach Aphis was found through the Midlands, but not on the frontier or in the Western Province. The White Peach Scale (*Aulacaspis pentagona*) was not uncommon in the nurseries near the coast, but more was found on certain florists' plants, such as geraniums and fuchsias, than on peach stock. The Orthezia (*O. insignis*) was found only in seaport towns, and there not on any fruit trees.

With a few exceptions amongst the smaller nurseries, the nurserymen have striven hard to clean up their premises, and a number which at the first inspection were considerably infested with Red Scale and Woolly Aphis, one or both, subsequently appeared to be quite clean. Thousands of infested trees have been burned in single nurseries, and tens of thousands fumigated, some being taken up and treated in fumigation chambers, and others treated under oiled covers stretched over frames as they stood in the ground. Fifty nurseries are now provided with permanent fumigation chambers, and a number of others will be similarly provided in the near future. Vine nurserymen are not obliged to have chambers.

FRUIT FLY.—The season of 1906 in the Eastern Province seems to have been the worst for the Fruit Fly (*Ceratitis capitata*) ever experienced. This insect remains active throughout the winter, and its relative abundance in any season appears to depend chiefly upon conditions enabling it to survive in comparatively large numbers until fruit, which it attacks, is again abundant. Not uncommonly it is extremely destructive one season and scarce, except in large fruits, in the one following, and *vice versa*. It is assumed that large numbers of adults survive some winters and account for a relatively heavy infestation of apricots and early peaches. Succeeding generations attack the later fruits. In some parts survival through the winter sometimes apparently depends on the occurrence of winter fruits, in which a generation may be passed. Ordinarily peaches and nectarines and some pears only suffer very severely, but last year over large areas apricots, figs, pears, plums, apples and quinces were almost all attacked. The Japanese plums have a name for immunity, and it was a surprise that they suffered. Of apples the Late Bloomer variety seemed to be troubled least. The Eastern Province Entomologist found that even grapes were infested to a slight xtent. Ordinarily the flies escape observation unless looked for closely, but in this season their abundance made them conspicuous; in some gardens in the east it was not exceptional to see half-a-dozen on a single fruit. Eggs were deposited even in pomegranates. The south-western fruit districts were not troubled to more than the average extent. Observations on a number of farms here left it evident that the presence of winter fruits may seriously aggravate the trouble. It chanced that there was almost no sale for Bitter Seville oranges in 1905, and that consequently this fruit was not removed from the trees until very late in the season on a number of farms. Large quantities of such fruit became infested and bred flies in the winter and spring, which in turn devastated the peach crops in surrounding orchards. Peaches grown on farms only a few miles away where little or no citrous fruit is grown escaped attack almost entirely. Loquats in some cases seem to account for an increase in the number of the flies early in the season. Obviously it is important wherever deciduous fruits are grown commercially to have all winter and spring fruits cleared from the trees as soon as practicable after it matures, and to be specially careful that no waste fruit remains. Many growers who are very particular about picking up daily all stone fruits in their orchards give no heed at all to citrous fruits and loquats in their home gardens. That the frequent gathering and effectual disposal of infested cultivated fruit is often disappointing as a means of checking the pest is due somewhat to its prevalence in certain wild fruits. The Kafir Plum (*Harpophyllum caffrum*), the Kei Apple (*Aberia caffra*), and the Red Passion Fruit (*Passiflora coerulea*) seem the more important of these fruits. Some specimens have also been reared from the Prickly Pear and from Monkey Apple (*Royena pubescens*). The far greater abundance of wild fruits in the East than in the West doubtless in part accounts for the greater trouble with the pest, and the dry winter of the East also doubtless favours the pest.

Hitherto the only measures recommended for dealing with the insect have been the gathering and destruction of infested fruit, and the netting in of trees. For nearly three years, however, the Eastern Province Entomologist has been experimenting with sprays designed to poison the flies before they laid their eggs. The mixture now adopted for the work consists of twenty-five gallons of water poisoned with one pound of arsenate of lead, and made attractive by the addition of two gallons of treacle or a proportionate quantity of sugar. This is coarsely sprayed over the trees. Fruit flies in confinement eagerly lap up the sweet from the foliage and are poisoned thereby, but it will take years yet to determine the value of the measures in practice. An extensive test was made in 1905, but in that season the pest gave little trouble in orchards surrounding those sprayed, so no good result was shown. In 1906 the results were distinctly encouraging, but swarms of fruit-sucking moths swept off most of the peaches which the spraying was expected to save. A satisfactory crop of apples, however, was harvested, and its good condition is thought to have been due largely to the spraying. Excessive rains have removed most of the poison soon after its application for the 1907 crops, and up to the time of writing, February 1st, the indications are that the pest will not be strongly in evidence even where no preventive measures have been taken. The severe winter appears to have almost exterminated the insect despite the enormous number of adults bred in the fall.

Cold storage appears to be fatal to the maggots. Indirect evidence to this effect has been brought to my notice several times, and this year a direct test was made. A number of boxes of maggot-ridden peaches were put in the Harbour Board Cold Store, where the temperature is maintained at 38° to 40° F. One box was removed at the expiration of seven days, and live maggots in abundance found. Another box was examined at the end of fourteen days. Every peach contained maggots, but only five showing signs of life were found in the box. A third box was opened at the end of three weeks. Each peach yielded from three to twelve dead maggots, but not a single living one was found. Most of the dead maggots were quite fresh looking, but those kept were found to discolour in a few days. Further tests will be made during the present season. Fruit shipped to England is cold stored about three weeks before it is marketed, and fruit sent to the United States for a week longer, and hence the danger of South African fruit carrying the pest to those countries is extremely remote. In my opinion there is no danger at all. Fruit shipped oversea is, as a rule, very carefully selected and taken from the trees before the stage of maturity at which oviposition by the fly is likely to have taken place in ordinary seasons. Moreover it should not be forgotten that the fly readily attacks oranges and other fruits in the South of Europe, the Azores, and Madeira Islands, from which fruit is shipped to northern markets without cold storage. Maggotty oranges have been imported into England over many generations without the pest having even temporarily established itself, in support of which it may be mentioned that an Entomology published about a century ago (Kirby and Spence) alludes to the common occurence of maggots in fruit from the

Azores. Then again the fly is found, to a slight extent, over a large part of France, south of Paris, and, doubtless owing to climatic conditions exceptionally favourable for its hibernation in the previous winter, it did a good deal of damage in gardens around Paris during the past summer.

Codling Moth.—The importance of this insect as a pest justifies special mention of the work which the Branch did in regard to it during the year. The insect is present in nearly all apple growing countries, and thus there is nothing exceptional in its being at the Cape. But it is relatively new to the Cape, being known in the country for fifteen years only, and being comparatively limited in its distribution up to the beginning of the present decade, and, as is often the case with new pests, its ravages are very severe. Last season many Western Province fruit growers lost heavily in apples and pears through its attack, despite two to half-a-dozen or more sprayings with Paris green, and it is almost certain to levy a heavy toll for many years to come in all orchards in which it is established unless very careful spraying with a suitable poison is practised. In time it is practically certain to reach all sections of the country where apples and pears are grown commercially, for when mature it is a winged insect capable of long flight, and as a larva its habits are such that it is extremely liable to be carried accidentally to all parts reached by railroad from infested areas.

The introduction of infested fruit is the usual channel by which it reaches new parts from a distance; and recognition of this fact and a desire to stay as long as practicable the advance of the pest into still uninfested districts of the Eastern Province, where commercial apple culture is practised, has led the Government to prohibit the introduction of the kinds of fruit most likely to carry infection into certain districts. By Proclamation No. 51 of 1906, dated February 12th, the area thus protected embraces the districts of Albert, Molteno, Tarka, Bedford, Albany and Alexandria, and all the districts eastward of these except Aliwal North. The Railway Department refuses to accept consignments of the fruits concerned from stations without for stations within the area. The important centres of Grahamstown, Queenstown, King William's Town and East London are thus cut off from Western Province apples and pears, which is a source of grievance to a number of fruit growers and dealers whose private interests are affected, and incidentally a piece of good fortune for the few within the area who can hold their fruit late in the season. No oversea apples and pears, of course, are allowed in the area. Only five infringements of the regulations were brought to notice during the year, and it is thought that few took place.

When travelling in connection with other duties all of the office staff have kept a sharp lookout for the pest in parts hitherto not reported as infested. It was found during the year to be well established in Aliwal North, Kimberley, Beaufort West, Riversdale and Malmesbury, and to be present to a slight extent in Queenstown. Last year it was feared that Grahamstown was infested, owing to a few larvæ, mistaken to be of the species, having been found in the winter under the bark of a pear tree in the town; but subsequently a prolonged search appeared to show that the town was still quite free. Uitenhage was stated to be infested in last year's report, but as the statement was based on the finding of a few larvæ only, and as some gardens visited this year for other reasons appeared quite free, a fresh examination was made. The result showed the pest is firmly established in the town, although it has not yet showed itself in sufficient numbers to attract much attention. Fort Beaufort, Alice, King William's Town, East London and many other towns in which search was made appeared clean.

Heretofore Paris green has been used as a remedy. In some hands it has proved very satisfactory, but its liability to scorch the foliage has been a great drawback. It got a bad reputation last year, particularly when owing to a demand for which the supply of good brands was unequal merchants sold inferior brands and several substitutes, some of which were not intended for application to foliage. Experiments conducted by the office in previous years had demonstrated the superiority in almost every respect of arsenate of lead, but the price of 2s. a pound at which this was offered prevented its adoption. On inquiry it was found that if a good demand could be created for it, the price could be made to compare favourably with that of Paris green. Accordingly I sought to create the demand, and induced a merchant to order out a ton lot and offer it at 9d. a pound This is the retail price in the part of America where the commodity is manufactured. The result was surprising, and led to the importation of about nine tons. The strong demand for a hitherto unasked for article is practically certain to lead to introductions of very inferior brands, that may seriously injure trees; and to avoid risk of damaging their trade with farmers, merchants should consult this office before selling any brand which has not been proved reliable in this country.

Despite all that has been said and written about remedies for the pest, many fruit growers who have the insect in their orchards remain profoundly ignorant on the subject. In general they belong to a class that reads little and is not attracted to farmers' association meetings. Believing that much good might arise through discussing the matter with them on their farms, I had Mr. Dreyer spend many weeks at such work. Most attention was devoted to the outlying fruit growing districts, where there are fewest of the "new school" of fruit growers to set an example in the application of remedies.

A highly-coloured article on the suppression of insect pests by introduced natural enemies, which was published by a popular monthly magazine, and extracts from which were re-published in local newspapers in an early month of the year, misled many fruit growers into believing that a certain parasite of the Codling Moth, introduced into California from Spain late in 1904, gave abundant promise of proving as great a check on its host as the well-known Vedalia proved on the Australian Bug. Unfortunately, there seems little room to hope that the highly desirable result suggested will ever be realized, and so far as I have learned up to date the parasite has made little impression. In a few months I expect to visit California, and then to learn by actual observation what progress, if any, it has made. If it appears to be proving a valuable ally to the orchardist in his warfare against the pest, an attempt will be made to get a colony for introduction into the Cape. Three species of parasite have been bred from Codling Moth collected in the Peninsula, and two of these at least have been observed in the Paarl district. Mr. P. Cameron, a prominent English authority on the group to which the insects belong, has identified the two as *Pimpla heliophila*, Cam., and *Hymenobosmina pomonellæ*, Cam. Not one of the three seems of much economic importance. In 1905 the *Pimpla* appeared to be destroying a large percentage of the pest insect in one orchard under observation, but in 1906 its victims there were decidedly scarce.

An insect allied to the Codling Moth, which has been termed Natal Codling Moth by the Natal Entomologist, occurs in Natal and in the warmer eastern parts of the Cape Colony and the Transvaal. The chief cultivated fruits which it attacks are the stone and citrous fruits and guavas. But although its potentiality for mischief seems as great as its notorious relative, it is in most years a pest of little consequence, at least in Cape Colony. There is a chance that it may have very powerful parasitic checks, which might be of service against the true Codling Moth; hence the Eastern Province Entomologist has been instructed to learn all he can about its economy. The Natal Entomologist discovered several years ago that its eggs are subject to parasitism.

LOCUSTS.—Matters in connection with locusts occupied considerable thought and time on the part of the Branch during the year, although little attention was given to actual field work. The importance of the subject leads me to devote more space to it than to other matters. Two distinct species of plague locusts ravage the Cape Colony, the Red-winged Locust and the Brown Locust.

The Red-winged Locust (*Cyrtocanthacris septemfasiata*, but better known as *Acridium purpuriferum*), is the larger of the two, but the one of less importance. It is *the* plague locust of Natal, the eastern low veld of the Transvaal, and of a strip of coast in the east of the Cape Colony. Its present visit into Cape territory began in 1893, and two years later its vast winged swarms covered most of the country to the coast east to south-east of Griqualand West, and south of the coastal range of mountains swarms migrated early in 1896 westward to Swellendam. Since 1896 it has been confined to the eastern seaboard. Few swarms were reported in 1906 either in the Colony proper or the Transkei, and fewer still of late months, and it is not improbable that the long invasion is practically finished. However, it is not yet safe to speak with any degree of confidence, for there is far greater trouble from the species in Natal in this 1906-1907 season, than there was in the 1905-6 season, and the present condition of the Cape may be a short lull before another storm. The Red-winged Locust should not be confused with the large, clumsy, heavy-bodied, gaudy-coloured Locust (Phymateus sp.), which often occurs in tiny swarms in the Western Province; but when the south-western districts do get large migratory swarms of locusts they are probably always of the true Red-winged species. At long intervals the Cape Peninsula and the adjoining districts have been ravaged, and many an up-country farmer fervently hopes that this fortunate section of the Colony may soon suffer again, not from any illwill towards the vine and fruit farmers, but in order that the Government in Cape Town may be brought to realize the gravity of the locust problem inland. The last invasion of the Cape and surrounding districts occurred in 1843, on which occasion vast swarms perished in the sea and were returned by the waves, with the result of impressing townspeople as effectively in death as they had the country people in life, though in quite a different manner. Previous invasions are recorded in 1653, 1687, 1695 and 1747. The 1747 invasion was particularly severe, the garden crops and pasturage of the then very small Colony being destroyed. Many cattle and sheep died of starvation in consequence, and meat doubled in price. These facts are mentioned to stimulate interest in the locust problem on the part of Western Province legislators, who, because they have never been directly affected by the pest, seem not to regard it seriously.

The Brown Locust (*Pachytylus sulcicollis*) is the chief migratory locust at present. It is preëminently an inland species, swarms rarely reaching the eastern seaboard and perhaps never the southern and south-western. The present invasion began in 1890, and reached its height in Cape Colony in 1892 and 1893. Invasions by this species have been of much greater frequency than invasions by the Red-winged, and the idea has prevailed since 1893 that the pest would shortly disappear, as it is credited to have done after a few years of abundance in times past. This hope of an early abatement of the plague without organized assistance on the part of man has doubtless been a potent factor in the neglect of the Government to wage a vigorous campaign against it. Yet sixteen years have passed since the first swarms came out of the arid north-west, and though the numbers of the pest have fluctuated very considerably, and in a few seasons have been relatively insignificant, there is still no sign that the invasion is approaching a termination. In the hope of obtaining data that would throw light on the duration of locust visitations in the past one of the staff this year spent much time in searching out references in old records, books of travels and other likely sources of information. The knowledge gained is disappointingly meagre, but sufficient to my mind to show that the pest comes so often and stays so long, and is of such importance that the Government should determine, as far as possible, what measures to mitigate the plague are profitable and warranted by circumstances, and should keep *in continuous readiness* to bring those measures into action. The first inland locust invasion to which we have found definite reference began in 1797, about eleven years after the site for Graaff-Reinet, the first Karroo town, was decided upon, and lasted until about 1808. In 1824 the country as far south as Bedford was again overrun, and remained so until about 1831. The period 1843 to 1854 seems to mark the next invasion. Then with the break-up of the memorable 1862 drought the pest appeared and remained until 1876. From 1876 to 1890 the eastern part of the country seems to have been quite free, but some swarms are said to have appeared in the drier north-central portion of the Colony in this interval. It is quite safe to say that the Kalihari Desert and the country round about it is the centre from which the more habitual parts of South Africa derive the initial swarms of an invasion, and the pest spreads east, west, and south, and apparently northwards as well. Somewhere or another in that vast region it is probable that the insect is present every year, and it is not at all unlikely that it is also a permanent inhabitant of extensive tracts of country south of the Orange River, as in Bushmansland and portions of Griqualand West. The circumstances which give rise to the enormous swarms which at intervals migrate from these parts are still shrouded in doubt, which future observations, extending over an indefinite series of years, alone can dispel. However, the writer conjectures from his meagre knowledge that a period of excessive abundance of this species of locust is terminated chiefly by the agency of locust birds and fly parasites, and that therewith the pest disappears from notice. In the parts of the country where the conditions favourable for life are most uniform from season to season enough of the enemies may permanently remain to prevent excessive multiplication, perhaps over large areas, as, for instance, the midland and eastern districts of the Cape, to bring about total extermination. Meanwhile that in regions like Bushmanland and the Kalihari, where longer droughts prevail, the enemies are more or less completely lost through the entire absence of any food for them, while the pest is preserved in the egg stage, and thereafter left to be controlled principally by the limitation of its food. Then that by the occurrence of an exceptionally favourable season, when there is an abundance of eggs in the ground, immense swarms are matured, which tend to migrate on the wind to distant parts. Naturally the bird and insect enemies, being scarce, are unable to cope with great swarms for a few seasons, and during this time the pest continues to multiply and spread, it now having unlimited good country before it. If no fresh swarms arrived the better country would, it is conjectured, become cleared of the pest by its increasing enemies soon after the climax of the invasion was reached; but reinforcements to a greatly varying extent appear to come from the desert parts for successive seasons. It is more difficult to suggest an explanation for the incoming swarms that thus prolong an invasion, but it is possible that they are in reality swarms which were hatched in the better country and which migrated desertwards soon after acquiring wings, with the result of temporarily throwing off their enemies to a large extent, or else that they are the immediate descendants of such swarms. Although it has not been demonstrated that very extensive migration of newly-winged swarms towards the desert occurs from the country south of the Orange River, such a movement appears to be the rule in the Transvaal, according to the late Transvaal Entomologist; and altogether there is much ground for suspecting that the occupation of the invaded territory is kept up, directly or indirectly, entirely by the swarms which mature therein.

It is now established that in South Africa locusts can be fought most economically when they are in the voetganger (hopper) stage; and persons who have had experience with the measures now advocated are probably all agreed that the destruction of voetgangers *that threaten crops* is generally very profitable. Statistics collected by the Natal Entomologist on the result of the 1906 locust campaign in that Colony show that the crops, which otherwise would in all probability have been devoured by the pest, were valued at more than ten times the expenditure. Unless there is certain to be ample food for both pest and stock, it is also probably very profitable in most districts to destroy voetgangers *that threaten the pasturage* only. But whether or not it is economical to destroy locusts in one district because of the damage which they or their descendants might do in other districts is at present very problematical. If thereby an extensive invasion might be averted, it certainly might pay to incur an enormous expenditure in destruction measures even in sparsely-settled, non-agricultural country, where locusts are regarded as much a blessing as an evil; but if all that is practicable will not materially lessen the extent of an invasion of better parts, it seems absurd to undertake destruction in parts of the country where it is not clearly profitable on local considerations.

From the foregoing paragraphs, I hope it is evident that a very urgent need in South Africa is more complete information on every phase of the locust problem. It is important to ascertain the areas in which the pest may survive during the years when it appears to be absent from settled parts; to learn definitely what conditions account for the periods of excessive abundance; to what extent invasions are kept up by swarms originating in inaccessible territory, and whether or not many swarms from districts where extermination is practicable return to desert parts to breed. Clearly such questions can be satisfactorily answered only through observations made throughout the whole of South Africa, subject to visitation. In the portions where active measures against the pest are undertaken, there is still more direct application for data on the occurrence and distribution of swarms, inasmuch as such information is necessary to enable the government concerned to be prepared with supplies. For this more direct object Natal has had a system of reporting in operation for ten to twelve years in connection with its Locust Destruction Act. The Transvaal began two years ago, adopting as its method the broadcasting of many thousands of postcard forms, on which the police, farmers, and others were requested to note the passage of swarms and other information. The Cape has not organised any comprehensive system of locust destruction under Government supervision, but off and on for the past dozen years has collected information from field-cornets and others; and early last year my Branch began a methodical and almost complete system, which it is hoped will be continued indefinitely. The system is a dual one, consisting of immediate card reports by private parties and monthly statements by the police. With the assistance of the local Magistrates in selecting them, one or more parties in every field-cornetcy throughout the portion of the Colony subject to visitation was appealed to to furnish us with a postcard report (1) whenever swarms arrive or pass; (2) when eggs are laid; (3) when eggs hatch; (4) when young locusts get wings, and (5) when new swarms leave the vicinity. Two hundred and eighty-one voluntary reporters have thus been secured. Each of these is kept supplied with a few postcard forms, and sent, at least, an occasional circular acknowledgment, with thanks for his assistance. The place from which he reports is marked on a wall map, and the information received from him is shown on small labels pinned to the spot. By using different coloured labels the information for several successive months is kept distinct. The receipt of every card is recorded in a book against the sender's name, both to enable us to know when to send more cards and to show us at a glance if interest appears to have been lost. The map shows roughly the condition of the country as regards locusts for a series of months, almost up to date, as the approximate size of swarms, whether winged or voetganger, the direction of movement, the time of pairing and egg laying, and the presence of locust birds, are all indicated. A small map for permanent record is compiled from the large one each month.

one, two, or three years, and some perhaps far longer. In support of the suggestion may be mentioned the facts that the evaporation of moisture from the surface is extremely great in the parts of South Africa referred to, that the showers are generally violent and of short duration, causing much of the water to flow over the surface to lower levels instead of soaking in where it falls, and that rains in cold weather are not likely to affect the eggs. That eggs may hatch after being in the ground for a number of years is a common belief in parts of the Colony, and although most of the statements which one is told in support of the belief are doubtless unreliable, a few appear to be thoroughly trustworthy. Nevertheless, the writer would be somewhat sceptical were it not that he has secured experimental verification. Eggs in large quantity which were secured in August, 1904, have retained their vitality. The bulk has been kept dry in tins and jars, and at intervals of a few months successive small lots have been transferred to dishes, wetted, and placed in an incubator heated to about 90° F. In every instance hatching has commenced in about ten days. Large numbers are hatching now, February 9th, 1907; and it is worth noting that they are from a lot of eggs that is stored without surplus soil in a deep jar. At first the jar was closely covered, and after some months it was noticed that moulds were growing, and that a rank odour pervaded the contents; in consequence the jar has since been left open to the air. During the summer experimental lots when wetted have hatched without artificial heat, but one lot wetted during winter and kept at the room temperature did not develop. One incubated lot, which after an abundant hatching was allowed to become quite dry, was again wetted, and kept warm, with the result of bringing out a few young which had not developed on the first occasion. This was in agreement with the common observation of many intelligent farmers that several hatchings from one laying of eggs may take place, each following after a rain; in such cases it is assumed that the soil fails to receive and retain sufficient moisture from the first rains to penetrate the whole egg-pod. Under normal conditions in the districts from which they were received, the eggs used in the abovementioned experiments would have hatched in September or October, 1904. This explanation for the sudden development of the pest in a magnitude which gives rise to the migration of mighty swarms would be greatly strengthened if it were shown that invasions from the north-west into the Orange River Colony and the Cape districts to the southward coincided with the break-up of extensive droughts in the far north-west. Unfortuntely, little meteorological information in regard to the area concerned is available. But Moffat in his "Missionary Labours" states after being absent twenty years the pest appeared at Kuruman in the good season of 1826, after several years of severe drought in those parts, the great invasion of the Colony in 1863 and 1864 followed dry years, terminating in the terrible drought of 1862, and the last invasion came with the splendid seasons 1889 to 1891, when, after a succession of poor years, the far north-western districts shared in the wide-spread, soaking summer rains. Good years in the arid parts, however, do not necessarily harbinger an abundance of locusts, for through the agency of natural enemies or other causes in previous seasons the pest may at the time chance to be relatively scarce.

The conditions in the Cape Colony as regards the species of locust under discussion appear to have been no worse last year than in the year before. The area south of the Orange River received little of the pest from the parts to the north and west, and the districts which suffered most were those lying north of the Sneeuwbergen and Winterbergen and between the Transkei and the middle line of the Colony, the locusts, apparently, being the progeny of those which bred in the same area the year before. I am unable to present any statistics to shew the extent of the damage done. In general the veld recovered quickly, owing to the abundant rains, but a great number of farmers lost a large part of their crops. The Orange River Colony and the Transvaal were more unfortunate than the Cape. During March many immense swarms entered Eastern Bechuanaland and Griqualand West from the desert, and, together with great swarms bred in the parts named, migrated south-easterly, easterly, and north-easterly into the neighbouring Colonies. It took them about a fortnight to pass from Kuruman and from the Langeberg to the border. These swarms devastated the winter veld over large areas, and deposited eggs far and wide. When the spring rains came voetgangers appeared in what is said to have been an abundance unprecedented since the settlement of the country, and it is said that over whole districts hardly a square mile of surface escaped the pest.

A vigorous campaign against the insect was waged in both Colonies, but great numbers, it is thought about as many as were killed, reached maturity. At the time of writing small swarms are numerous in the Cape Colony, and many are already laying their eggs. Were it not that locust birds, both large and small, are rapidly on the increase, and are exceedingly numerous already in many districts, one might safely predict that the pest will be as bad during 1907 as in any year since 1893. During the past month, January, however, very extensive hatching is reported to have followed exceptionally good rains in Gordonia, Kenhardt, and Carnarvon, and there is danger that the swarms developed in these parts may migrate east and south-east and inundate the country to an extent far beyond the capabilities of the birds to materially effect destruction during the first season—in other words, that we will have a return of the conditions which ruled in 1893. I reiterate that the Government should give its most serious attention without delay to the problem of mitigating the ravages of the pest. With the hope of stimulating action, a lengthy memorandum on the subject, in which a definite scheme of organisation was suggested, was submitted by me in January, 1906. But on the ground that the most rigorous economy was necessary, the estimate of £7,500 which I recommended was cut down to £500, an amount too small to warrant the appointment of any special officers. A vote of £10,000 will be recommended by me this year, and no doubt this much can be expended to the great advantage of the country, even if the pest proves less abundant than last year. If the money is not voted, the uncreditable anomaly of the Cape Colony standing by and doing practically nothing, while the smaller and younger Colonies, which for years it worried with appeals for co-operation, are doing their utmost, will continue to exist. The methods of destroying the pest developed in recent years in South Africa are far in advance of those known in the past, and if locust destruction was ever profitable in the country it certainly is now.

Plant Pathology.—Not an inconsiderable portion of my time during the year was given to matters which are in no sense entomological. Such is the correspondence in relation to fungus and bacterial diseases of plants, which is referred to me for attention, and enquiries in relation to the failure of citrous trees, the distribution of the Black Spot of the apple (*Fusicladium dendriticum*), and the investigation of Bitter Pit of the apple,—all of which in the ordinary course would be duties of a plant pathologist. These and other non-entomological subjects have had my attention, owing to the Department's lack of a plant pathologist and my chancing to feel a greater interest in them than the other technical officers; but this attention has of necessity been of a superficial nature, and is intended by me merely as a makeshift pending the appointment of a specialist to take such work in charge. My knowledge of the conditions enables me to say that the fungous and bacterial diseases of cultivated plants in this country are increasing much more rapidly than are the insect enemies, and I hold that the services of a fully competent plant pathologist is now one of the most pressing needs of the Department. There has been a suggestion to establish a South African inter-colonial research laboratory, with duties to embrace plant pathology; and the possibility that action towards securing an expert may be delayed by the greater proposition leads me to remark that, irrespective of any central laboratory, the Colony will urgently need one or more well-qualified specialists in the line.

CHAS. P. LOUNSBURY, B.Sc.,
Government Entomologist.

Office of the Government Entomologist,
Department of Agriculture,
February 14th, 1906.

APPENDIX V.

REPORT of the Agricultural Assistant for the Year 1906.

APPENDIX (5).

REPORT OF THE AGRICULTURAL ASSISTANT FOR THE YEAR 1906.

In the preparation of this report I have endeavoured, in accordance with your instructions, to sketch concisely the activities of the branch without entering upon detail. These will be found in the special reports and papers, a list of which is furnished. The report deals with the work of the year under four general heads, (1) co-operative experiments, (2) experiment stations, (3) travelling, (4) office work, and at the conclusion the opportunity is taken of referring to several subjects which have received or deserve special attention.

Co-operative Experiments.—The most marked feature in the work of the year has been the growing interest shown in the co-operation experiments, which are now in progress all over the Colony. These trials of new seeds and of different sorts of fertilisers, distributed free, are arranged and supervised by the Department, but are carried out by the farmers on their own land. Reports are in due course furnished by the farmers on the success or otherwise of the experiments. Out of the mass of facts so accumulated generalisations as to the practical suitability of certain new crops to the Colony or to some portions of it are beginning to become apparent. The results, besides being instructive to the individuals concerned, are collected and published from time to time in the *Agricultural Journal*. Already by this means certain new crops are securing a footing in the country. The process of trial, selection, and elimination is necessarily a tedious one. The larger the number of trials the greater the certainty of the results, and more rapidly can decisions be arrived at. It is therefore very encouraging to record a steadily increasing issue of parcels of seed and artificial fertilisers. This great demand indicates in the most practical manner the public approbation of the efforts being made. The limited vote available is, however, inadequate fully to provide for requirements, and supplies of many sorts of seed are exhausted without prospect of being replenished before next financial year. This discourages applicants and retards the introduction of possible new crops. The charges for railway carriage on the numerous small parcels despatched is a heavy drain on my small resources. Another difficulty is that of inducing merchants to stock the more promising new kinds of seed, for which there must at first be a slow and irregular demand. Frequent enquiries for the purchase of seed for large sowings of sorts tried experimentally with success reach this Office. The Department cannot well undertake the business of buying and selling, yet private enterprise is slow to seize the opportunity presented. Applicants are directed to firms likely to supply their needs, but too often the orders have to be transferred abroad, and the sowing season is thus lost. There is, of course, a risk in stocking a perishable article like seed, particularly new sorts, for which there is an erratic demand at present. As the experiments proceed and the farmers' attention is called to promising kinds the trade will no doubt grow, and firms first in the field will reap their reward. To some extent an established demand already exists for paspalum grass, cocksfoot grass, rape, vetches and Turkestan lucerne.

Comparing the years since this work was first taken in hand by this Branch, the following data are of interest:—

	1903.	1904.	1905.	1906.
Number of sorts of seed under trial	17	45	63	151
Number of farmers co-operating	59	215	505	1,491
Number of plots	76	313	2,808	4,492

The transference of the seed distribution work from Cape Town to the Experiment Station, Robertson, has materially facilitated the work and reduced expenses. Reports upon most of the crops grown in 1906 will be issued during the coming months.

The major portion of my assistant's time, and much of my own, is devoted to the inspection of growing experimental crops, and to arranging new trials, and the compilation and publication of results obtained.

While full details will be found in the pages of the *Agricultural Journal* of the results of these experiments, it may not be out of place to mention certain of the more striking results. European and Australian grasses are proving themselves well adapted and profitable in many localities, notably cocksfoot, fescue grass and paspalum dilatatum. The last-named grass often fails in the seed bed, and is certainly difficult of propagation, but, as it equally often gives a perfect germination, the fault is obviously not with the seed.

At Knysna, from a seed bed of 33 square yards, over 10,000 separate plants were secured, enough to plant out an acre. Rape, thousand-headed kale and vetches, and in summer certain of the millets, are proving capital crops for feeding milch cows and the like. The specially imported American tobaccos are not yet harvested, but promise well. Many failures have followed attempts to grow cotton; on the other hand samples have been produced valued by experts in England at prices up to 12d. per pound, as against 18¼d. per lb. for Florida fancy cotton of the same variety.

Experimental Stations.—Two experimental stations are now in existence, thus removing the stigma which has hitherto lain upon this Colony of being one of the very few civilised countries in the world without such means for research and study. The operations are still mainly of a preliminary character, but the first crops have been harvested and the first results recorded. These will, it is hoped, very shortly be available for publication. There has been much initial work necessary, particularly at the Knysna station, where the land was unbroken veld of the most barren and unpromising description. Owing to the unfortunate necessity for retrenchment all the preparatory work proposed has not been carried out, a certain amount being perforce left over to next year at both places. The use of artificial manures has given striking results, both on the new, if sour, veld of Knysna, and on the fertile, but worked-out, irrigation land of Robertson.

Rust.—With a view to combating the rust fungus in cereals, the most resistant of foreign wheats continue to be tried, notably the hybrids recently produced in Australia, which have proved safe there. Unhappily these have not shown equal immunity with us, although relatively resistant and so far valuable; this short cut to complete success is thus barred. Recourse has been had to the only alternative, the production of hybrids here, but it will take several seasons before any practical results are forthcoming. Over twenty different crosses were obtained this year at Robertson Experimental Station.

It is to be regretted that lack of means has prevented the establishment of an experimental station in the Eastern Province, as was intended, especially as strong desires in this direction have been expressed in several districts. It is to be hoped that when times mend the claims of the East will be favourably considered.

Travel.—In connection with the above duties, when sent to report upon any special matter, or when attending meetings and shows, opportunities occur of visiting districts and farms, and thus of coming in close contact with the community for whose sake the Department exists and of meeting farmers and ascertaining their needs in a manner otherwise impossible.

In the course of the year I have had occasion to visit the following Divisions: Aliwal North, Barkly East, Herschel, Queenstown, Cathcart, King William's Town, East London, Stockenstrom, Fort Beaufort, Tarka, Cradock, Grahamstown, Port Elizabeth, Uitenhage, Oudtshoorn, George, Knysna, Bredasdorp, Swellendam, Caledon, Cape, Malmesbury, Stellenbosch, Paarl, Tulbagh, Worcester, Laingsburg, and Robertson. Mr. Thornton's duties have occupied him chiefly in the Midlands and Western Province, particularly in Malmesbury, Tulbagh, Paarl, Graaff-Reinet, Middelburg, Murraysburg and Somerset East.

Intimate acquaintance with the peculiarities and needs of the various districts is essential, and it is with regret that I have to observe that I am still ignorant of the conditions prevailing throughout many divisions, particularly in the north and throughout the Transkei.

It is hoped that this important matter will not be lost sight of. The farming public are not in a position to protect themselves against fraud in the purchase of requirements of this sort. The aim of the Bill is preventive and protective. The knowledge that the quality of artificial manures, of cakes and feeding stuffs, and perhaps also dips and insecticides, is controlled and examined by Government should materially encourage their use by farmers, and the more widely they are used the better for everybody. The sense of doubt as to the nature and composition of such materials is at present without doubt a hindrance to many who might benefit by employing them had they sufficient confidence. The quality or value of seed depends on other factors than that of inanimate chemical compounds. Arbitrary standards are impossible. Seed is liable to rapid deterioration. At present merchants and farmers are constantly sending samples of seed to the Department for an expression of opinion as to quality, and such enquiries deserve to be encouraged. This the Bill proposes to do by the issue of certificates clearly indicating the purity, quality and vitality of the seed in question, thus eliminating one of the greatest risks which the agriculturist has to face.

Prickly Pear.—As the outcome of the deliberations of a recent Select Committee of the House of Assembly on Prickly Pear, I was instructed to carry out experiments with arsenite of soda by means of injections into the growing plant, or by such other means as might be found advisable. The experiments are now well advanced, and it is hoped shortly to give some useful information on this vexed subject.

A similar series of experiments is also being conducted upon that worse, because less obvious and equally harmful pest, the jointed cactus.

Tobacco.—The results of the experiments upon the flue-curing of tobacco are deserving of special mention. With the invaluable assistance of the United Tobacco Company (South), Ltd., and their leaf expert, Mr. Henderson, it was shown that ordinary Colonial tobacco could be materially enhanced in value by this improved treatment, while there is good ground for the belief that certain foreign sorts now being grown will give even better results. As a result of these experiments several flue-curing barns are being erected by private individuals, and there is no reason to doubt but that they will profit considerably thereby. It is still necessary to give wider publicity to these facts, in order that more may benefit from the information gained. To this end, I have proposed a grant in aid of construction, or a bonus on barns made or upon leaf cured, with a view not so much of the direct assistance as of attracting attention and stimulating interest. Full particulars as to construction and procedure are published by the Department in pamphlet form.

Another series of tobacco experiments are those with the Turkish variety at French Hoek, where the Department has secured the services of Mr. Stella to carry out trials, instructing the owners of ten farms in the culture and curing of a leaf of high value much sought after by manufacturers. At the time of writing there is good reason to anticipate that in every instance leaf will be produced equal in quality to that grown last year in the same vicinity, which fetched very satisfactory prices.

Last year in my annual report I called attention to our lack of reliable statistics regarding production. This need continues to be impressed upon me daily, and I have only to repeat what I then stated, which was as follows:—

"I have had occasion during the year to call attention to the highly unsatis-"factory condition of our statistical returns on agricultural matters. Important "enquiries have been made of this Branch from merchants seeking opportunities "to buy, or for an outlet for their wares, from persons desirous of taking up new "productive industries, from politicians, journalists, and others interested in the "welfare and progress of the Colony, and also from the Admiralty, anxious to know "to what extent we could supply our own wants in time of need. To all these it "has been possible only to give indefinite replies—general impressions—instead "of plain statements and clear cut and dried facts. In this respect our position, in "comparison to other agricultural countries, is far from satisfactory or creditable. "In a Colony such as this, in which the economic conditions are so rapidly "changing, it is of the utmost importance that figures be preserved showing our "state at different periods, especially as regards rural forms of wealth and the "food supply producible, but unless such data are accurate and entire, they be-"come less than worthless, positively misleading. I call special attention to this "point, as I have had occasion to feel our wants in this respect very severely."

Agricultural Education.—A matter which deserves particular notice is the widespread attention which the question of technical agricultural education is at present receiving. This public interest deserves encouragement. The forms in which it appears are various, suggestions being in the air for nature study, for travelling instructorships in agriculture, for vacation courses to school teachers upon agricultural subjects, for the preparation of elementary textbooks, and for the institution of academic courses and the granting by our University of a baccalaureate in agriculture. The proposals emanate from school boards, agricultural societies, farmers' associations and University Councils. Such a consensus of opinion as to the desirability of a more wide-spread knowledge of agricultural subjects merits sympathetic treatment and encouragement in every possible way.

I desire to place on record the zeal and assiduity of my assistants during a very trying year. Without their ungrudging help, overtime and beyond the strict interpretation of their duties, it would not have been possible to accomplish what has been done. As the amount of work steadily increases, and is likely to continue to do so, I would once again urge that additional technical strength be obtained. There is need for more agricultural assistants to meet the increasing calls and to provide for its continuance should occasion arise. In previous annual reports I have called attention to this need, and once again, and more urgently than ever, I make the appeal for an increase in the facilities for aiding farmers in the way more than any other they desire—the spread amongst them of knowledge.

ERIC A. NOBBS,
Agricultural Assistant.

Office of the Agricultural Assistant,
Department of Agriculture,
12th February, 1907.

APPENDIX VI.

REPORT of the Principal, Elsenburg Agricultural College, for the Year 1906.

I have the honour to present my annual report for the year 1906, along with those of the Viticulturist, Chemist and Superintendent of Experiments.

Academically matters have shewn improvement on last year. We had 29 students, and, with the exception of two who are debarred from attending next session, they are all young men capable of benefitting from the course. Of the 14 who left W. E. Mottram and A. V. H. Dold obtained first class Diplomas, and A. E. Rivett and A. J. Stigling second class. The small number can be accounted for by reference to my last report, which gives the number of students on 1st February, 1905, as 3. The award of medals and prizes has had a very salutary effect on the work of the students, and we are indebted to the Hon. the Premier for a gold medal, to the Hon. the Secretary for Agriculture, and the Hon. the Colonial Secretary for silver medals, to Dr. Beck, M.L.A., and several firms in Cape Town for prize money.

The curriculum briefly outlined in my last report is still in force, and works safisfactorily.

Early in the year, and before the Select Committee was appointed, a special course in Viticulture was advertised, but on account of the unsuitability of the candidates who applied, it was not conducted. For the same reason a short course in Dairying which we offered to run had to be abandoned. The value of a short or special course depends very materially on the previous knowledge and experience of the student, and when these amount to "nil" the most enthusiastic supporter of short courses must recognise as suicidal and insane the conduct of any self-respecting institution that would risk its reputation on a few weeks' work, unless indeed the applicant was of the superhuman type of genius rarely met with. Short courses are primarily intended for those already engaged in that particular branch of work, and not for men who desire positions of trust on the strength of a knowledge so superficial that it would spell ruin to themselves and their employers.

On the 19th June, 1906, it was ordered "That a Select Committee be appointed to enquire into, in regard to the Government Farm, Elsenburg,

(*a*) The Administration;
(*b*) The question of Revenue and Expenditure:
(*c*) The educational work aimed at and accomplished.

With regard to the work of the Committee, I would respectfully point out:—

(*a*) That its appointment so soon after my assuming duties here was unfair to me personally, especially in view of the circumstances in which the Institution then was, circumstances which were quite well known to the parties asking for the Committee.

(*b*) That its findings, so far as based on these circumstances, must have been such as to prejudice the future of the Institution, and the condemnatory tone of the report subsequently submitted fully bears out this contention.

(*c*) That on the question of Revenue and Expenditure, placed in the forefront of their report, the grotesque mistake of taking no notice of the present value of the Institution, its equipment, stock, etc., is made, and that in consequence the sum of £47,417 17s. 6d. should be £17,417 17s. 6d., which sum covers a period of seven years. A single State-maintained College in America has an expenditure of £114,650 in a year, and there are 65 Colleges in the United States.

(*d*) That I have a personal grievance with regard to the report, inasmuch as many of my answers have inadvertently or otherwise been changed. One —the crux of the whole question of Agricultural Education in South Africa—has been so hopelessly hashed that I insert it here. On being asked whether I did not consider it deplorable that each student should cost so much per year, my reply was "that I considered it far more deplorable that the Legislature of this country should be entrusted to men of such mean mind as to reckon the value of educational work on the L.S.D. basis." After five months I see no reason to change this answer, and, as stated, it includes the main cause of Agricultural education in this country not having accomplished so much work as it would otherwise have done.

How any fair-minded person, with any pretence of having the interests of Agricultural education at heart, could single out for arithmetical dissection the worst year in the history of the Institution, and from a particular case, in exceptional circumstances, argue general conclusions, I do not pretend to understand, and as the psychology of morbid conditions of mind has never appealed to me, I have not the slightest intention now to commence its study.

(*e*) That from the tenour of certain parts of the Report the bulk of the evidence was taken with a view to reorganization of Education, and if Halle be taken as a model a hundred years hence this country may be ripe for the change. It is noteworthy that re-organization, as subsequently expounded, was no part of the original remit.

I acknowledge with sincere thanks the Committee's recognition of my humble discharge of duty. Agricultural Education in this Colony rightfully claims and willingly has bestowed upon it all my energies so long as I hold my present position, and my zeal in its service must be my excuse for a bluntness of speech which has many disadvantages, but which can claim at least the merit of freedom from ambiguity, and obviates the necessity for explanation and interpretation, grave, subtle or condensed.

J. NOBLE JACK,
Principal.

Agricultural College,
Elsenburg, 31st December, 1906.

Agricultural College, Elsenburg,
31st December, 1906.

THE PRINCIPAL, Elsenburg College.

I have the honour to report that in my departments, during the past twelve months, the following works have been carried out:

In the Cellar. About this time last year several inexpensive improvements were made to the fermenting vats, to enable the red wine to be fermented with a submerged head. The landing stoep was fitted with perforated piping for the cooling of the vintage as it came in, and proved very effective during the hot spell at the time of the grape harvest. Something over 60 leaguers of wine was made. It is sound and in good condition, and has been kept on hand to the present for instructional purposes. During the vintage the greater part of the wine making and the grape gathering was done by the students, as has also been the handling of the wine in the cellar up to date.

In the Vineyard. The usual routine, such as cultivating, pruning, spraying, disbudding, etc., has been carried out all in good season and in an efficient manner, partly by the students and partly by native labour.

Besides planting in the misses, the European cepages in the S.E. corner of the Remount vineyard were eradicated, the ground trenched to a depth of 2 feet 3 inches, and replanted with Hanepoot and Sultana vines on American resistant stocks of the following varieties: Shiraz and Mataro a matter of nearly 3,000 sticks. Despite the short rainfall they have practically all taken and are coming on splendidly, and as soon as in bearing the two first named should give enough fruit for practical instruction in Raisin drying, and the others sufficient for experimenting as to their suitability for producing in this district a type of wine slightly different from that made from the existing cepage. I may here state that the whole of the vines, including the Cabernet, which is usually a shy bearer (except when pruned on the long-rod system), are carrying a heavy crop and looking in the pink of condition. Whether the prolonged dry weather will affect them before the vintage remains to be seen.

In the matter of manuring, the whole vineyard except that portion reserved for experiment has been given a light dressing of the following:—

100 lbs.	Government Guano.
300 lbs.	Basic slag.
70 lbs.	Sulphate of Potash.
30 lbs.	Nitrate of Soda.

Total, 500 lbs. per acre.

Seventeen experimental plots of 400 vines each have been treated with the following manures in various combinations and proportions, viz.:—Lime, Nitrate of Soda, Potash, Superphosphate, Government Guano, Basic Slag, Rooi Guano, Wilson's Compound, and Kraal manure from the Karroo.

In the Nursery. A considerable amount of vine grafting has been done by the students, principally of an experimental nature, relating to various stocks and scions. Some American varieties that we did not have were added to our list. The Zante currant was also introduced.

The Calimyena and Capri figs are doing well, and as many of these as possible have been propagated.

I would suggest that, if possible, next season, some effort should be made to introduce the insect (Blastophaga) for the purpose of caprification.

In the Orchard. A wind brake of eucalyptus cornuta has been planted on the south side, which, when grown, will afford considerable protection from heavy winds. 1,838 feet of 6-inch, 4-inch, and 3-inch drainage tiles have been laid in the lower wet part of the orchard, discharging into the main Oakbush sluit. The drains are all drawing well, and considerable improvement is noticeable in the trees on this area. The pruning, planting of misses, spraying, etc., have been wholly carried out by students. On the whole, the trees have made good growth, and those in bearing are carrying a fair crop of clean fruit.

In Extra College Work.—During last Christmas vacation I visited the vine-growing centres of Robertson and Montagu, and gave information to a number of wine farmers there, who are about to re-constitute their vineyards, as to what I considered suitable American stocks for their different soils. During the winter vacation I visited Clanwilliam at my own expense, and gave demonstrations in pruning, and also advised farmers about to plant as to stocks, varieties of grapes, etc.

Having been appointed by the Paarl Farmers' Association as one of the Commission to enquire into "the failure of vines on American stocks," etc., the greater part of a week at intervals, when College duties permitted, was spent in visiting the farms of the district, and in collecting the necessary data to frame a report, which was duly delivered to the Association. Later on I gave a paper before the above Association on "The manuring of Vines and Fruit Trees." At the solicitation of some of the vine growers I translated from the French "Vermorel's Practical Guide for the Distillation of Wines, Mares, Lees, and Fruits," which was submitted to the Paarl Farmers' Association, and is now being printed.

When requested by farmers in this district, I visited their cellars, and gave them advice in the matter of clarifying and the manipulation of their wines. For the Co-operative Branch of the Agricultural Department I inspected and valued the fustage to be taken over by the Drakenstein Co-operative Winery. Several days were also spent in collecting information and photographs for the writing of a monograph, "Viticulture in Cape Colony," for distribution at the Colonial Exhibition to be held in London.

This, with a few minor trips, such as going to Tokai to buy vines, a couple of days reporting on wines at Constantia, visiting vineyards supposed to be suffering from some disease or other, and judging for Paarl Farmers' Association in the Orchards competition, practically completes the outside work done by me during the year.

J. TRIBOLET,
Lecturer in Viticulture and Horticulture,
Elsenburg Agricultural College.

Agricultural College, Elsenburg,
31st December, 1906.

DEPARTMENT OF CHEMISTRY.

THE PRINCIPAL, Elsenburg Agricultural College.

I have the honour to submit my report on the work done, other than the delivery of lectures during the year 1906.

Manures.—Analyses of samples of the following natural and artificial manures used in the "manuring of Oathay experiments" have been made: Government Guano, Sulphate of Potash, Nitrate of Soda, Superphospate, Basic slag, Stable manure, and Slake lime; the last mentioned (Government contract lime) was of very poor quality, containing 29·24 % of Silica and refractory silicates.

of such mean mind as to reckon the value of educational work on the L.S.D. basis." After five months I see no reason to change this answer, and, as stated, it includes the main cause of Agricultural education in this country not having accomplished so much work as it would otherwise have done.

How any fair-minded person, with any pretence of having the interests of Agricultural education at heart, could single out for arithmetical dissection the worst year in the history of the Institution, and from a particular case, in exceptional circumstances, argue general conclusions, I do not pretend to understand, and as the psychology of morbid conditions of mind has never appealed to me, I have not the slightest intention now to commence its study.

(*e*) That from the tenour of certain parts of the Report the bulk of the evidence was taken with a view to reorganization of Education, and if Halle be taken as a model a hundred years hence this country may be ripe for the change. It is noteworthy that re-organization, as subsequently expounded, was no part of the original remit.

I acknowledge with sincere thanks the Committee's recognition of my humble discharge of duty. Agricultural Education in this Colony rightfully claims and willingly has bestowed upon it all my energies so long as I hold my present position, and my zeal in its service must be my excuse for a bluntness of speech which has many disadvantages, but which can claim at least the merit of freedom from ambiguity, and obviates the necessity for explanation and interpretation, grave, subtle or condensed.

J. NOBLE JACK,
Principal.

Agricultural College,
Elsenburg, 31st December, 1906.

Agricultural College, Elsenburg,
31st December, 1906.

THE PRINCIPAL, Elsenburg College.

I have the honour to report that in my departments, during the past twelve months, the following works have been carried out:—

In the Cellar.—About this time last year several inexpensive improvements were made to the fermenting vats, to enable the red wine to be fermented with a submerged head. The landing stoep was fitted with perforated piping for the cooling of the vintage as it came in, and proved very effective during the hot spell at the time of the grape harvest. Something over 60 leaguers of wine was made. It is sound and in good condition, and has been kept on hand to the present for instructional purposes. During the vintage the greater part of the wine making and the grape gathering was done by the students, as has also been the handling of the wine in the cellar up to date.

In the Vineyard.—The usual routine, such as cultivating, pruning, spraying, disbudding, etc., has been carried out all in good season and in an efficient manner, partly by the students and partly by native labour.

Besides planting in the misses, the European cepages in the S.E. corner of the Remount vineyard were eradicated, the ground trenched to a depth of 2 feet 3 inches, and replanted with Hanepoot and Sultana vines on American resistant stocks of the following varieties: Shiraz and Mataro—a matter of nearly 3,000 sticks. Despite the short rainfall they have practically all taken and are coming on splendidly, and as soon as in bearing the two first named should give enough fruit for practical instruction in Raisin drying, and the others sufficient for experimenting as to their suitability for producing in this district a type of wine slightly different from that made from the existing cepage. I may here state that the whole of the vines, including the Cabernet, which is usually a shy bearer (except when pruned on the long-rod system), are carrying a heavy crop and looking in the pink of condition. Whether the prolonged dry weather will affect them before the vintage remains to be seen.

In the matter of manuring, the whole vineyard except that portion reserved for experiment has been given a light dressing of the following:—

100 lbs.	Government Guano.
300 lbs.	Basic slag.
70 lbs.	Sulphate of Potash.
30 lbs.	Nitrate of Soda.

Total, 500 lbs. per acre.

Analyses of Sheep kraal manure and Sheep kraal manure ash were also made. Appended are analyses of samples of these materials, as well as that of a sample of Stable manure for comparison.

	Stable manure. June, 1906. Produced at Elsenburg. The manure stood in an exposed heap during summer.	Sheep Kraal manure. June, 1906. From Uitkijk Siding, district Beaufort West.	Sheep Kraal manure. August, 1906. From Carnarvon.	Sheep Kraal manure ash. August, 1906. From Carnarvon.
	Per cent.	Per cent.	Per cent.	Per cent.
Water	44·26	36·02	47·14	9·08
Loss on ignition, Organic matter	19·38	30·41	33·16	6·58
Nitrogen	0·71	0·98	0·83	trace
Phosphoric Oxide (P_2O_5) ...	0·65	0·87	0·51	1·66
Potash (K_2O)	0·84	2·62	4·11	10·41

The composition of both Stable manure, Sheep manure, and Sheep manure ash, being influenced by many conditions, is subject to great variation, consequently the above comparative analyses are not of general application.

The proportion of alkali in the ash is naturally much higher than in the unburnt manure, so much so that it would be desirable to conduct field experiments with the ash, to ascertain what quantity can be safely applied.

Soils.—Soil investigations in connection with the "Manuring of Oathay" experiments, with a view to extending the practical deductions to be drawn from chemical analysis, are still proceeding.

Milk. -During the year 617 samples of milk have been tested, the object being to test the quality of the milk of the following breeds of cattle:—Friesland, Shorthorn, Jersey, Ayrshire, and Cape.

In addition to determining the Fat content of the mixed milk of each breed—morning and evening- the Fat content of the milk of individual cows of each breed has been determined. Considerable variation in the morning's and evening's milk is to be noted. This investigation is nearing completion. Appended are the results of the breed tests.

Cows milked twice daily:—6.30 a.m. and 4.30 p.m.

Breed.	No. of Cows used for Test.	Period of Lactation.	Average of Five Weeks.	
			Morning's milk. Per cent. Fat.	Evening's milk. Per cent. Fat.
Friesland ...	4	Varied from 3 weeks to 11½ months.	2·5	3·5
Jersey ...	5	Varied from 1 month to 8 months.	3·7	6·05
Shorthorn ...	2	1 month and 2½ months ...	2·47	3·79
Ayrshire ...	2	5 months and 5½ months ...	3·19	4·82
Cape ...	2	2 months and 4 months ...	2·88	3·77

GEORGE N. BLACKSHAW, B.Sc.

Agricultural College, Elsenburg.
31st December, 1906.

THE PRINCIPAL, Elsenburg College.

I have the honour to submit my report on the experimental work of the farm during the year 1906, carried out by me in the time at my disposal unoccupied by my lecturing duties.

Mealies.—Knowledge regarding the most suitable varieties of this valuable summer forage crop is wanting. Past experience of the non-uniformity of the area selected for the experiment dictated this year the substitution of the row in place of the plot system. Forty-five varieties, including Dent, Flint, Pop, and Sweet classes, were sown on October 16th, with a check row of Hickory King every fourth row, to enable a fair comparison of yields to be made. The area—an acre—is one which adapts itself well to dry cultivation, and though the season has been a dry one, the previous cultivation to induce the soil storage of winter rains and the judicious formation of mulches during germination and subsequent inter-tillage to prevent capillarity, has resulted in a growth which compares most favourably with that obtained on similar ground under irrigation. They will be harvested during January and February. The experiment therefore has been conducted to serve also as a demonstration of the results which are to be obtained from scientific cultivation of the soil. It is gratifying to report that, as was expected, farmers who visited the College have shown a great interest in the work of this Department.

J. F. W. GATHERER.

A few spots of Oidium were found on some young Cabernet, otherwise the vineyards are free of this fungus. A great deal of time was spent in checking the depredations of the Calandra, this being, according to farmers in the district, one of the worst seasons in this respect. Experiments were carried out during September with Strawson's Vaporite. A number of vines were chosen, and round each eight holes, measuring about eight inches deep and two inches wide, were made, receiving one ounce each of the Vaporite. The soil was then replaced and rammed down. This insecticide, when buried, possesses the property of gradually giving off an insect-suffocating vapour, which frees the soil from insect ravages It did not, however, free the vines from the Calandra, but the agent for this insecticide contended that this experiment could not be looked upon as a test, because he should have had the Vaporite buried when the vines were in the dormant stage.

A Green Precipitate of Sulphur was also supplied gratis, for combating Oidium. Its virtue lay in its extreme fineness, and therefore wider distribution, but on analysing a sample, the fineness was found to be 27 degrees Chancel and only 59·8 parts sulphur. These proportions are not what is required of good sulphur. Another Sulphur was found to possess a fineness of 42 degrees Chancel, and was sold as possessing a fineness of 50 degrees Chancel, and when used its distribution was noticed to be very uneven and difficult, covering the vines in patches.

No Sulphur should be sold for viticultural purposes much under, say, 60 degrees Chancel fineness, and it perhaps would be as well, since a Bill is being brought forward for the standardisation of artificial manures, that Sulphur be included in the Act. The brands used and found to be good were those of Brandram's and Lloyd's.

The following additional vines, occupying a little more than seven acres, have been added to the Estate, planted in block No. 3:—3,900 Cabernet, 1,400 Reisling, 3,300 Hermitage, all on Metallica Stock. The situation is on a hillside, of most desirable aspect, and should yield a wine of good quality.

1,000 Shiraz have been planted in block No. 2. These vines, when planted, were fed with the following manures:—

1. *Odam's Vine Fertiliser*, showing a guaranteed analysis of 3 per cent. Ammonia, 16 to 18 per cent. soluble Phosphate, 3 to 5 per cent. undissolved Phosphate, 4 to 5 per cent. pure Potash.

This fertiliser was supplied gratis by the Agents, Messrs. R. Wilson, Son and Co., Cape Town.

2. *Stable Manure and Wood Ashes*, old, were mixed in the proportions of 1½ of Ash to 12 of Manure. The Potash compounds bring about a rapid and thorough decomposition of the organic substances of the Manure, which are then readily assimilated by the plant, as are also the inorganic substances.

3. ***Kraal Manure***, from Uitkyk, Beaufort West, the actual cost of which, landed at Wynberg, amounted to £5 14s. 2d. per truck of eleven tons. Karoo Manure on analysis shows the following:—Nitrogen, 1·88 per cent; Lime, 7·80 per cent.; Potash, 2·80 per cent.; Phosphoric Oxide, ·08 per cent. The ash freed from organic matter contains 19·5 per cent. of Lime and 7·00 per cent. Potash.

These vines, without exception, show a good, strong growth.

Extra expense had to be incurred in requisitioning the services of another span of Convicts, in order to eradicate the kweek in the Vineyards, to complete the trenching of block No. 3, and to generally clear up overgrowths, etc.

American Vines.—The recommendation of the Commission appointed last season that all the growing Metallica stocks on the Estate be grafted with Jacquez was not thought advisable, owing to there being a greater demand for Metallica than could be supplied, either from here or the Stellenbosch Plantation. One of the Commissioners gave as one reason for this recommendation that it was suggested in order to discover the affinity existing between these varieties.

The result of an experiment of that kind will be apparent on visiting the Government Plantations at Stellenbosch, where Jacquez can be seen growing most prolifically on Metallica stock.

This experiment was carried out by Mr. A. J. Cloete, who is in charge of the Plantation, some years back with every success. Judging from these, little doubt as to their affinities exist.

About a dozen of the Metallica on this Estate were cleft grafted with Jacquez scions, in order to test whether the stocks had been disbudded previous to planting. Results showed that this had not been done, and it would therefore be a task of great labour and expense, and is bound to be accompanied with small success if the recommendation of the Commissioners is ever carried out.

Many of the recently imported stocks, not doing well in block No. 5, were transplanted to No. 3, where the growth has improved. Of the Muscat Varieties grafted on the Hybrids 3,306, 3,309, 1,202, 101-14, 44-01, and Jacquez, the growth on the first four is quite four times that on the latter two; that on 44-01 is poor, and under present conditions does not recommend itself.

No. 1,202, as a Muscat bearer, is ahead of the others, but of this stock it is said that it succumbed to the attacks of the Phylloxera in France; this, however, is no reason why it should not prove to be a valuable Muscat Stock in such soils as do not allow a too free development of Phylloxera, and where such soils exist this Hybrid should be favoured. Also, we must consider that the Jacquez does well in this country, while in parts of France it failed.

Considering the length of time this insect has taken to destroy European vines generally in this area, as compared to other districts, this would indicate that the soils do not favour the development of Phylloxera to any great extent, and in these soils the low resistance of the 1,202 may prove sufficient.

The vigorous growth and quantity of healthy fruit borne by Hanepoot grafted on this variety and growing in an infected area on this Estate, up to the present, quite justifies this theory.

Hybrid 1,202 came into prominence in France because of its great vigour and adaptability to lime soils. It appears also to be the stock adopted in Spain for Muscats.

One of the characteristics required of stocks is adaptability to soils, and in this light the following varieties can be considered: Hybrids numbers 3,306, 3,309, 101-14, 44-01, possess a resistance of 18, and are of a vigorous growth; Hybrid 1,202 is especially vigorous, and according to reports to hand from farmers, amongst whom cuttings were distributed, this stock bears out its reputation with regard to its adaptability to lime soils.

The Aramon x Rupestris Ganzin, numbers 1 and 2, is also very vigorous. Of the varieties doing poorly under present conditions, here as well as in the country districts, are: Rup. Metallica Franc, Grand Glabre, Rup. Martin No. 2, Azema, Mission, and Du Lot. In some instances Mission appeared to do fairly well, and also Du Lot in loamy soils. One farmer obtained an all-round poor growth by planting these varieties in black sandy soil. A quantity of both Cuttings and Rooted Stocks will be available this year. A large portion of these should be distributed in the districts of Worcester, Oudtshoorn, Ladismith, Robertson, Uniondale, Tulbagh, and other districts where Raisins are largely produced. These stocks are limited, and farmers in those districts should co-operate, obtain a suitable plot of ground, share expenses, propagate cuttings, and so avail themselves of the opportunity of experimenting with them. Such a course will prove of greater benefit than the distribution of a few cuttings to two or three farmers in each district.

If this Estate is to be self-supporting and run on commercial lines, then its development in that direction must immediately be proceeded with, and its remunerative sources tapped.

A block of ground suited for a Nursery for Grafted Vines, and from the sale of which large profits can be made, both stock and scion growing on the place, must be cleared of the vines now occupying it.

About a dozen cows can be supported with natural pasturage and fodder grown on the Estate; from these a small revenue will accrue from the sale of butter, and the present expense of purchasing manure will consequently be eliminated.

An additional source of income could be derived from the breeding and rearing of pigs, the woods on this Estate being particularly adapted to that purpose.

If the commercial line is to be followed, then an extra sum of about £300 should be put on the Estimates to carry out these works.

Appended is the Report of the Supervisor of the Government Vine Plantation at Stellenbosch, which is being kept in perfect order by that Officer.

T. L. WATERMEYER,
Manager.

Government Wine Farm,
Groot Constantia,
14th February, 1907.

APPENDIX VIII.

REPORT of the Horticultural Assistant for the Year 1906.

The circumstances of this Colony for the past year in regard to agriculture and the industries correlated with it, especially the fruit industry, have been somewhat exceptional; and certain influences belonging to previous years, notably the prevailing droughts, have altogether worked themselves out. It will be scarcely necessary to enter into a discussion upon the effects produced upon those industries by the continuous set-backs occasioned by the severe droughts. Of more immediate interest to us are the very favourable climatic conditions which since have prevailed, particularly in the Eastern Province and Midlands. The rainfall has been most seasonable and regular. These parts of the country are those which have suffered second worst from the set-back through unfavourable seasons. But with the recuperative power which the Cape seems to possess, things have fast improved.

Most people are aware that the rainfall of the Eastern Province differs considerably from that of the West, not only in the time but also the manner of its incidence. Here, Westaway, the wet season, taken upon a long average, may be said to have developed from the middle of May to the early part of September. The maximum precipitation has, almost invariably, been in the latter end of June. Now in the East things are different; there has always been, or one should say, there has been expected, what has been biblically termed "the former rain and the latter rain," that is to say, there has been two distinct seasons of precipitation, one the Spring rains in November, and subsequently the Autumn rains, divided more or less equally between the months of February and March. It would almost seem that such an arrangement admits of greater possibilities of caprice in the supply than could happen in the West. Sometimes the former rains have failed to appear in November. If deferred till well into December the fruit crop is retarded, and stinted and irregular ripening takes place at the harvesting. This is exactly what has happened during the years of drought and depression just past, when men were ever looking for some encouragement through good seasons. During the present season the rains have appeared quite normally as to time in almost every district. And, in fact, such mischief as has occurred has been due rather to a superabundance of moisture than to a deficiency.

The fruit industry, which we have now commenced to look upon as an additional source of wealth, has to some extent been disappointing in certain districts on the high plateau Northaway, when late frosts, hailstorms and high winds came most inopportunely for both the late blossoming trees and for the early kinds, which had already set their fruits. This deplorable check to a new and most hopeful industry in the districts referred to is much to be regretted. Elsewhere, Eastaway, the fruit harvest has been successfully reaped. Here, Westaway, continuous spells of cold weather prevailed during the early Spring months, yet the fruit crop, although somewhat retarded, suffered but little, the only set-back being the prevention of the proper pollination of the blossom and the check of the normal growth of what had already set. Grapes suffered perhaps more than any other fruit, and the result became very evident when Anthracnose made its appearance in many of the vineyards, notably those in the Constantia area. Showery and dull weather continued at a time when we have usually brilliant sunshine and a fairly dry atmosphere. Such conditions make themselves felt throughout these wine districts when the crop comes to the press. Notwithstanding the unfavourable weather which obtained in the Western Province during the early Spring months, the fruit crop turned out to be the largest on record, and this is mainly due to the large additional numbers of trees lately planted coming into bearing, and the skilled care now given to those already producing, together with the lucky chance of a fruitful season. The oversea markets continue to call for first class fruit in quantity, and prices have ruled above the average. Arrangements now made for placing fruit with prospective buyers after it is landed should go far towards increasing our export trade and pulling off top prices for all first-class stuff sent forward.

On receiving directions to see to the cultural wants of orchardists and others engaged in farm work, I proceeded to the Districts of Hay, George, Oudtshoorn, Graaff-Reinet, Somerset East, Albany, Cradock, Bedford, King William's Town, East London, Komgha, Cathcart, Queenstown, Paarl and such neighbouring centres as demanded my services At Douglas I met a representative gathering of farmers, who keenly discussed lucerne growing with a view to putting the lands below the water furrow under that fodder, and also listening attentively to my address on fruit-growing; at the same time watching pruning demonstrations upon the orchard trees already planted. Here, owing to the distance over a bad road to the station, farmers intend going in for fruit-drying, and arrangements are being made for erecting a drying plant for their use.

At George, owing to the linking up of the railway, landowners are realizing the necessity for adding to the products of their farms, and are starting orchards of apples and pears. Apples of sorts are specially suited to this district, and more than one orchard has been planted and worked on the most modern principles. These should form an object lesson to those about to start fruit-growing here.

The citrus fruits claim most attention in the Oudtshoorn district, and my visits were chiefly confined to farmers growing this class of fruit; yet on my tour I found many growing apples, pears and plums as well, to say nothing of the tobacco planter, who also demanded his share of information from me. It is mainly among the small landowners at Calitzdorp where fruit-growing will be more taken up than by the main body of farmers, who have relegated the whole of their arable lands to lucerne and the ostrich.

The whole of the erven in the town of Graaff-Reinet is either under vines or fruit, and while here I visited quite a number of growers, who had this or that to ask upon which they sought advice, discussing, and demonstrating where necessary, the means for improvement.

But little has yet been done in the matter of growing fruit on the commercial scale in the Somerset East District. During the past two years orchards have been planted upon the erven lately sold below the town, and these are doing so well as to justify a continuance of similar orchard plots.

Grahamstown has not been backward in responding to the appeals of this Department to push the fruit industry, and can now boast of the best kept commercial orchard in this Colony. Other fruit plots on the large scale are being laid out, and are, so far, most promising. Lower Albany may, since it was taken in hand by this Department, be called one huge garden plot, producing citrus fruits, pines and apples of the best. In fact fruit-growing is now almost the sole industry and support of the farmers in this district. The cultivation of pines and citrus fruits is assuming very large proportions, and I have reason to know that in most cases brings really good returns to the growers. In some places I observed a signal success in the production of apples and Japanese plums. The samples of the former variety of fruit staged at the local and Grahamstown shows would do credit to the owners if exhibited among the same class of fruit here Westaway. The results obtained from placing pines upon the London markets point to a large and growing trade, provided growers will carefully pack only the best fruit with good showy tops.

The District of Bedford has great capabilities, and I am extremely gratified to find the orchards already laid out doing so well. Komgha can now show one of the largest orchards of deciduous trees, as also one of the largest citrus groves, which bear the impress of care and skill in the selection of sorts as well as the after management. I know of no more interesting evidences of fruit-growing, Eastaway, on the large scale, than the orchards standing near Prospect Station. If an object lesson by would-be growers is wanted, here certainly is one, and I am pleased to find so very many beginners profiting by the lesson which these orchards teach.

Cathcart, including Surbiton, Bontebokflats and Waku, all on the higher plateau, are growing the finest of late pears and apples, for which these parts are so very admirably suited, and I am glad to notice that others are imitating what the larger growers have done, and the yearly tale of additional orchards adds to the value of one's former visits made in the fruit industry.

Whittlesea has for some time past been growing good fruit, which, owing to its distance from the market, could not always be profitably sold. With the early prospect of a railway renewed efforts in fruit-growing are being made, and the repeated calls for my services made by the district farmers leads me to appreciate the earnestness with which they are pushing on. In my tours almost all the orchards seen in previous years were inspected, and I was pleased to find the errors in practice very few, and it is gratifying to see the old-fashioned rule of thumb methods giving way to practice founded upon the knowledge of principles. And throughout my visits I have noticed a distinct improvement in the way cultural difficulties are dealt with, and random guesswork remedies founded on no principles are becoming obsolete. I am also pleased to hear from farmers in the districts already visited of the advancement they are making, and more so to find that they eagerly look forward to meeting the Officers of this Department, who are able to yet still further advise them on the cultures they are engaging upon.

Meetings, at which I lectured and gave practical demonstrations on fruit culture, were held, and discussed and advised on such matters of a cultural nature as demanded my attention. I need scarcely say that in all matters where climatic conditions are so particularly differentiated as between East and West, I went, not only to teach from previously acquired experience, but to learn and correct my own former views by every tittle of observation possible, and by every reliable statement of the results of cultures and other men's working; and I take leave to say that it is only by such personal intercourse between growers, having a common object in view, that fruit culture has a chance of improvement, and also that such personal intercourse between the Officers of this Department and the cultivators generally is by far the best method of putting the Agricultural Department thoroughly in touch with that portion of the public whose interests it is to forward. In revisiting many of the places where I had been the previous year, it was very gratifying to find how frequently efforts had been made to carry out the recommendations given. The readiness shown in accepting methods implying an unusual amount of trouble is one of the most hopeful signs which could be wished for. There was manifested everywhere the greatest interest in all cultural matters discussed. The conclusion hence became irresistible that, in the districts visited, there is every intention on the part of farmers to take a new departure and add fruit-farming to other cultures. I would wish to add my personal thanks to those whom I had the pleasure of meeting for the very kindly appreciation accorded to my efforts, and for the evident good feeling towards the Department, which has been everywhere in evidence.

EUSTACE PILLANS,
Horticultural Assistant.

Office of the Horticultural Assistant,
Department of Agriculture,
28th March, 1907.

APPENDIX IX.

REPORT of the Registrar of Brands for the Year 1906.

I have the honour to submit my annual report on the working of the Brands Registration Act, No. 12 of 1890, as amended by Acts Nos. 18 of 1892 and 4 of 1897, during the year ended 31st December, 1906.

The total number of Brands registered during the year was 211, as follows: Aberdeen, 27; Albany, 14; Alexandria, 4; Aliwal North, 2; Barkly East, 1; Barkly West, 14; Bathurst, 9; Bedford, 1; Cathcart, 6; Herbert, 7; Gordonia, 16; Jansenville, 1; King William's Town, 1; Kimberley, 3; Komgha, 1; Ladismith, 2; Mafeking, 28; Murraysburg, 2; Somerset East, 17; Tarka, 25; Uitenhage, 16; Vryburg, 9; Willowmore, 5.

During the year the Congress of the Agricultural Union of the Cape Colony, when considering the question of amending the existing Brands Acts, emphasised the undesirability of permitting every farmer to select his own brand, thus practically endorsing the suggestion made in my report for last year that the assignment of brands be wholly entrusted to the Registrar.

It is satisfactory to note that the number of applications for the registration as brands of signs, which it is all but impossible to properly index, are not so numerous as hitherto.

It cannot be too strongly again urged on owners that it will be to their best interests to discard the use of symbols, more especially of those forming figures with an unbroken outline, such as circles, triangles and the like.

The reprinting of the Brands Directory brought up to date would be but waste of money, in view of the fact that it already contains several similar brands, that, owing to various causes, numerous brands have undoubtedly long since fallen into disuse, and that it is all but impossible to decipher many of the earlier signs or symbols.

There is at present, however, no provision by which such brands can be removed from the Directory, thus enabling the cost of their unnecessary inclusion therein to be avoided.

The best, if not the only, way to remedy the admitted defects of the existing Acts would appear to be the introduction of a measure making it compulsory for every owner who uses a brand to register it in accordance with what is known as the "*Three-piece System*," *i.e.*, a brand consisting of two letters and one numeral of standard pattern, and on one line. This system justly claims many recommendations to favour; among other advantages it affords a ready means of identifying a brand and of tracing the ownership of a strayed or stolen branded animal; its working is simplicity itself, and its employment precludes the possibility of the registration of a duplicate brand. It has, moreover, been found to answer most admirably in other countries.

Until the passing of such a law it would be unreasonable to expect any improvement in the protection intended to be secured to owners by the branding of their stock.

BARRY McMILLAN,
Registrar of Brands.

APPENDIX X.

REPORT of the Travelling Dairy Expert.

I have the honour to present herewith my annual report for the year ending December 31st, 1906.

As the re-appointment of the Dairy Expert to the Department and the re-starting of the dairy demonstrations and lectures dated only from 1st October, 1905, full advantage was not yet taken this year of the opportunities offered; but I am glad to say that as the year drew out both the correspondence and the work increased, shewing, I think, that they are becoming aware of the advantages placed before them by the Department.

Dairy Waggon.—This waggon was completed at the end of the previous year, and is replete with all the necessary appliances for both butter and cheese making, milk testing, etc., and was used considerably during the first half of the year, chiefly in the districts of Komgha, Stutterheim, Cathcart, Queenstown and Grahamstown. All the equipment is kept packed in the waggon, which serves as a store when it is not necessary to take it away, or when only a portion of it is required. The waggon met with an accident during the year, through a weak and defective brake; this was repaired in Cathcart, and is now in good order, as is the equipment packed therein.

The actual use of the dairy waggon and its equipment is, I am pleased to say, of not such great value as in former years, as in the various districts which I have visited I find the farm dairies are, speaking generally, far better equipped than was the case a few years ago. Even when I have had the dairy waggon with me in a district I have not often had occasion to use it, but have used the equipment which the farmer has, which is very often complete.

The following Farmers' Association meetings were attended during the year, viz.: Komgha (twice), Tarkastad, Lower Albany, Toise River, Molteno, Post Retief, Vryburg, Phokwani, Upper Cathcart, and Stutterheim.

The following Agricultural Shows were attended during the year, at which I acted as judge in the dairy and produce section, viz.: King William's Town, Dordrecht, Cradock, Grahamstown, Port Elizabeth. The East London Show I was prevented from attending on account of indisposition.

Butter-making.—The butter-making industry in the districts that I visited shews a decided improvement. Farmers are one and all striving—of course, some more so than others—to improve the quantity and quality of their product, and the old-fashioned methods are fast disappearing. The fresh butter exhibited at the various shows was very good throughout, more especially that which I examined at Port Elizabeth and Grahamstown Shows, the prize butter at these shows being really excellent.

At all the demonstrations that I have given I have always laid very great stress upon the preparation and the method adopted in the ripening of the cream, which I consider, after the fundamental requirement, cleanliness, is the most important, and many places which I have again visited, I find from enquiries made that my methods have been adopted with very considerable advantage.

The demonstration in both butter and cheese making have been well received, but in some cases might have been far better attended in so far as numbers are concerned; but wherever held they have most undoubtedly done good.

Transport of Butter by Rail.—This matter has been a subject of correspondence almost throughout the year, and although up to the present nothing has been done, I am still in hopes that the dire necessity may be shewn to the Railway Department of some accommodation in the shape of covered houses at stations where a considerable traffic is done in dairy produce, and also better accommodation on board the trains.

Sale of Butter on Municipal Markets.—I have made it my special duty when in towns to visit the Early Morning Markets to see the butter as it is arranged for sale, and under what conditions it is sold, and I am quite convinced that there is room for improvement both in the way it is marketed and the treatment it receives at the markets. One often finds a really excellent butter packed in a doubtful box lined with old newspapers, the print of which comes off on to the butter. I have naturally condemned this system, and always advised the producers to improve, but on the other hand the market agents, more especially in large centres, allow the butter to be handled and tasted by anyone and everyone; not only one pound but as many as the public think fit. This habit is the more palpable on markets where the large buyers include coolies, as these often use their finger nail to obtain a sample to taste. This can well be understood is not appreciated by the purchasing public.

During the month of May a tour was made amongst the suppliers of cream to the South African Co-operative Dairy Co., Ltd., Adelaide, with the object of explaining to them the absolute necessity of attending to and ripening their cream properly, and to endeavour to induce them to improve the quality of the cream sent to the dairy, as complaints by the management were rife at the time. The Manager of the dairy informed me later that, from the quality and condition of the cream since supplied, he thinks the visit was of considerable value, as the cream is being sent in in a better condition. Many farmers supplying cream to this dairy live a very considerable distance away, as far as the other side of Peddie, entailing a long journey by wagon to Alice Station and subsequently by rail to Adelaide Station. This most undoubtedly militates against its quality, and especially calls for extra care and treatment, with good attention while on the road. Through my representations a cream store was erected at Alice Station, but unfortunately, though being certainly a help, could have been built on better lines.

The price of butter during the first half of the year maintained a good average, but during the latter portion fell very much indeed, owing undoubtedly to the heavy rains and consequent supply of milk being so largely increased; but nevertheless where the producer had a good name and reputation for his butter, the price of the earlier half of the year was maintained, clearly proving that a really good, sound article will always realise its market value.

Cheesemaking Industry.—During the year considerable time has been given to this industry, and I am glad to be able to report that there are at present very hopeful signs indeed for a large increase in the industry. It is being successfully carried on in the Territory of Griqualand East and the districts of Aliwal North, Kimberley, Bechuanaland, and Albany. From all accounts and reports received, the industry has once again been thoroughly established, and I have every reason to believe that it will spread. Special visits were made to Bechuanaland, Griqualand East, and Aliwal North for the furtherance of this industry. The season for cheesemaking as a rule commences about October. According to the present conditions it should continue up to the end of May, but for the purpose of this report I am quite unable to make an estimate of the output from October to the end of the year. For the whole season I do not consider that it will fall short of one hundred to one hundred and five thousand pounds weight.

Besides, in the districts mentioned in which cheese is being made, other schemes are in course of formation, principally about Stormberg and in Kokstad division, and I am led to believe that in the Aliwal North district if the cheesemaking that has been started there turns out successful and a good marketable article is manufactured, other ventures will follow. The one I mention is a private one, the milk being the farmer's own supply. I have lately visited this place, and I am quite satisfied with the results so far, and feel confident of ultimate success.

The isolated position of many of the farms throughout the Colony renders any other industry than cheesemaking expensive, and considering that the climate is conducive to the manufacture of cheese, it is hard to understand why it is not more readily taken up. The chief objection that I am always confronted with by the farmer is that he cannot give it the time it requires, nor has he the requisite knowledge, and, therefore, gives up the idea, and continues to farm in the old way, making little or nothing out of his milk. But it is possible for everybody to realise the market value for cheese, no matter how remote from a station or town.

I am satisfied in my own mind that the cheesemaking industry is going to be one of our foremost branches of dairy-farming as soon as the farmer realises it, and a few good examples are set by pioneers of what can be done. Under present conditions it has everything in its favour; the market is assured, and we shall have to manufacture very largely indeed before the question of overproduction appears. I have noticed in districts where cheese is made, that the local consumption has increased. You will find Colonial cheese on tables that never or hardly ever saw the imported article. This leads one to think that the consumption of good local cheese will be far in excess of that of the imported article.

The prejudice against the Colonial article is still much greater than it should be. A proof of this peculiar prejudice was very marked at a border town a little the industry if a school of this description or even short courses in dairying were established, where farmers' sons would have the opportunity of receiving an insight into the subject of dairying, sufficient to put them into a position to start dairying on their own account, or to become Assistant Managers and ultimately Managers of any creameries or cheese factories that may spring up in the Colony. Unless we can train our own young men and instil into them the desire to further the industry and induce them to take it up as a means of earning a livelihood, we shall have a great uphill fight to put this Colony into the position of being able to support itself in so far as the dairy industry is concerned.

During November I had the pleasure of being able to visit Mr. Challis—Dairy Expert to the Natal Government—and he very kindly accompanied me to Mooi River Creamery and Nels Rust Creamery, both in Natal. The visit was highly instructive, and the opportunity of being able to visit Mr. Challis and converse with him as to dairying in Natal was undoubtedly of mutual benefit.

I would here like to recommend that it would be of great advantage to the industry at large if the Dairy Experts to the various Governments were permitted to come together simply for the interchange of ideas and discussion.

I had also the opportunity of visiting Cedara Experimental Station in Natal.

Poultry Industry.—In so far as the Poultry Industry is concerned, I regret to have to report that very little indeed is being done by farmers to make this the valuable adjunct to general farming that it should be. In towns the Poultry industry, through the auspices of their respective Poultry Societies, is certainly improving, but the one to whom we have to look for the supply of eggs and poultry for the market, viz., the farmer, takes but little interest in it.

Late in the year I received from England the poultry diagrams for lecturing purposes, and I was able to give before the end of the year three public lectures on Poultry, viz., at Molteno, Queenstown, and Kokstad. The first two were fairly well attended, but the last at Kokstad very poorly.

It has been my aim while on the farms to try and arouse interest in Poultry-breeding, and I shall continue to do so, but up to the present, I regret to say, that I do not think it has been of much avail.

You will undoubtedly notice that I have not touched in my report in any way upon the Creameries, for the reason that this work appears to be done by another office.

In concluding my report for the year I sincerely hope that in time—for it is work that does not make itself manifest at once—with the aid of good seasons we may see arising in our midst a dairy industry that we may well be proud of.

R. SILVA JONES,
Travelling Dairy Expert.

Office of the Travelling Dairy Expert,
Queenstown, 23rd February, 1907.

After the Shows were over, I received further instructions from the Secretary for Agriculture to carry on the work, and as you are aware, all the Civil Commissioners of the different districts which I proposed visiting were communicated with, requesting them to advise all public bodies, both English and Dutch, and arrange for the meetings at the most suitable places, whether in town or on farms. I considered this the best policy, *i.e.*, working through the Civil Commissioners, owing to their being local men and knowing the different requirements of their districts.

The meetings having been arranged by these officers, I then visited 40 districts, holding in all 85 meetings at which 3,502 farmers attended, this giving an average of 41 farmers at each meeting, and when one takes into consideration the very great distances some of these farmers travelled for the express purpose of gaining information, it speaks well for the energy of the farmers concerned, and I feel not a little encouraged thereby. The success of these meetings is in a great measure due to the energetic efforts of the Civil Commissioners and Secretaries of public bodies, for which I feel greatly indebted. They informed members of the different organisations of my visit, and did their utmost to make the work a success by placing at my disposal Town Halls, Court Houses, and other places, together with all necessary appliances, thus enabling me to come into contact with so large a number of farmers.

As may be expected, I came across a great many who were sceptical about the work, but the majority were earnest in their endeavour to give it a trial; at the same time, I am afraid that one year will not be sufficient to eradicate the very bad name which we have at present on the Home and Continental markets, and I only trust that the farmers who have tried this year the methods taught, and have not gained financially, will still adhere to the practice, so that the manufacturers who have bought the wool this year will be in a position to judge and enquire for the same clips in following years. In passing, I may say that a great deal of wool is being grown totally unsuited to the particular district; certain types of sheep will give the greatest monetary results if properly placed, whereas, if misplaced, the sheep may thrive, but will not give such a large financial return as they otherwise would. A great deal of this is due to breeders relying on fancy; we cannot afford to breed a fancy sheep, but must have the type that pays best in that particular district.

The result of my work, from what I can gather, has resulted in success; in a great many cases the farmers are well satisfied with the prices obtained for their wool, but in several other instances which have been mentioned to me the owners appear anything but satisfied; at the same time, they intend to carry on the work, provided the methods of selling and buying are improved.

In visiting the different ports where the bulk of the wool is sent to, the buyers have a great deal to contend with, but at the same time very little inducement has up to the present been offered to the farmers who make an effort to meet the requirements of the buyers, and the backward farmers will not admit any forward movement until the more advanced farmers have proved by a financial gain that it will pay them to proceed on these lines.

The farmers, in the preparation of wool for the market, have made a distinct step forward, so I have been informed by many of the buyers at Port Elizabeth, East London, Cape Town, and Mossel Bay, and I hope, as the farmers get more advanced in their ideas, the system will be greatly improved upon, as at the present moment a great many of the so-called sorted clips are very far from what they should be. I have made it a special point when visiting the ports to see wool from all parts of the country as it is received by the sellers, agents, and others, so that I can gauge any advancement and the quality of work done, and in what way the farmers are at fault in their methods; a great deal has yet to be done before even a fair result is obtained; to make myself clear, I will give a case in point: In visiting Port Elizabeth I noticed a very large clip of some seventy odd bales which was placed on the market as sorted wool, but in going over this clip I took samples of wool from a great many of the bales and had them divided and valued by several buyers afterwards; one class of wool was very inferior, probably off the backs, which was valued at 5d.; the other portion, which was far in excess of the inferior wool, was valued at 10½d. per lb. Now, in several cases whilst on the farms I took the opportunity of weighing the fleece as it came from the sheep, and then removing inferior backs, the result being that the backs and pieces removed varied from 1 to 2 lbs. from the fleece, leaving from 6 to 7 lbs. of good, light, clean wool, worth at present market rates 1s. per lb. Of course one cannot expect too much the first year, but I would like to impress upon the farmers that in doing this work it is essential that it should be done thoroughly

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the great discrepancy in prices between Australian and South African wools, one cannot help wondering what the cause is of such a vast difference in price of the raw article. It would be well for the farmers in South Africa, with the assistance of the Government, to go into this question very deeply, and try and find what really is the cause of the difference in price.

I would suggest that the three or four winter months could be spent by me in holding classes at some centre for the proper instruction of young farmers or sons of farmers, so that they would be able to get a thorough ground-work of the sheep and wool industry, and be in a position to benefit from the results of the work done at this class, at the same time gaining all information from other countries, which might be of use to them in South Africa, thus laying a sound foundation upon commercial lines; or, in place of this, say a course could be held at the Elsenberg Agricultural College.

There is a decided move amongst farmers, who in latter years went in so largely for Persians and cross breeds, to come back to the Merino sheep again. I cannot but think that it is a great mistake on the part of these farmers to attempt a cross with the Merino and Persian to get a pure Merino wool, which will take about eight years to accomplish; a better plan would be to gradually get rid of them to the butcher, and supplement with pure bred Merino. Persians and Merinos should not be allowed to run together, owing to the hemp and hair rubbing off the Persian into the Merino wool.

I would strongly advise these Persian sheep farmers to look to the future, and have the wool, as well as the carcase, to fall back upon. Cape Colony is, I consider, essentially a fine wool Merino country, and the immense strides which have taken place in the past few years have proved that they can do well with but very little attention. The fewer mixed breeds of sheep we have the better for the Colony as a whole. I think the advancement of the sheep industry during the past years goes clearly to prove that, with the assistance of the Government to elevate it, South Africa will rival other sheep and wool producing countries.

W. M. McKEE,
Wool Expert.

2nd March, 1907.

CAPE OF GOOD HOPE.

Report of the Department of Agriculture for the Year ended 1907, with Appendices.

Presented to both Houses of Parliament by Command of His Excellency the Governor
1908.

RESUME OF PRINCIPAL WORK DONE BY THE DEPARTMENT IN 1907.

1. The Animal Diseases Act Amendment Act, No. 16 of 1906, was enforced from the 1st March, 1907, but attention was specially devoted to stamping out lung-sickness.

2. Experiments with lamziekte were conducted at Koopmansfontein, in Barkly West District. Important results have already been obtained. The work is drawing to a close as far as the Veterinary Department can carry the investigations. Bacteriological work requires to be done to complete the experiments.

3. Worms in ostriches are being investigated in Oudtshoorn District. For various reasons this work is not making the progress which was expected. It will be necessary to consider how it can be prosecuted with better promise of success.

4. Lungsick virus, redwater vaccine, mallein for testing glanders, and serum for inoculation of sheep against blue tongue (blaauwtong) were manufactured and sold. Sponsziekte and Anthrax vaccines were sold at cost price.

5. Investigations into the cause and prevention of bars in ostrich feathers were conducted by Professor J. E. Duerden, of Rhodes University College, Grahamstown, with the aid of a Government grant.

6. The borders between this Colony and the Transvaal and Natal were patrolled by Cape Mounted Police and Cape Mounted Riflemen respectively, the latter aided by native guards, to prevent the introduction of East African Coast Fever. The fences on these boundaries were kept in thorough repair, and the patrols were strengthened when required.

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8. Contributions were made towards the construction of three cattle dipping tanks to the extent of half the cost, but not exceeding £75 per tank.

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10. One hundred and seventy-eight brands for animals were registered.

11. A Veterinary Conference was held at Bloemfontein, at which representatives of all the South African Colonies and States were represented, with a view to uniformity in inter-State regulations regarding animal diseases.

12. The importation of animals and plants was controlled to prevent the introduction of disease.

13. Localities were quarantined for various periods on account of animal diseases.

14. Demonstrations in wool skirting, sorting, rolling, etc., were given in a number of Districts.

15. The Dip Depôts, numbering about 270, were closed, resulting in a saving of expenditure of about £1,800 per annum, without disadvantage to the farmers.

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17. Experiments were begun, and in two instances completed, to ascertain how long scab-infected kraals harboured infection. In one instance infection was communicated to clean sheep six months after the kraal was last used, and in another instance twelve months after.

18. Plasmopara having been discovered in January, and investigated by the Transvaal Plant Pathologist, this Government was recommended by him to adopt most stringent measures for its eradication, even to the extent of destroying all

CAPE OF GOOD HOPE.

DEPARTMENT OF AGRICULTURE.

REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR 1907,

WITH THE FOLLOWING APPENDICES :—

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4. **Report of the Government Entomologist.**
5. **Report of the Agricultural Assistant.**
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13. **Report of the Superintendent of the Government Guano Islands.**
14. **Report of the Editor of the Agricultural Journal.**

Presented to both Houses of Parliament by Command of His Excellency the Governor
1908.

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Upon the re-organisation of the Department in the middle of 1905 information was immediately gathered to ascertain the manner in which the various associations conducted their work, how they were constituted, and what work was accomplished by them. These enquiries were intended to be a preliminary step towards organising these bodies. Towards the end of that year a circular letter urging closer union was addressed to all the associations. The subsequent history of this movement is contained in the report of the Director of Agriculture for 1906. The principle of closer union is practically accepted by them, but on the question of the form which such closer union should take there is still great diversity of opinion. The object, however, is attainable, and I hope that the benefits which are anticipated to be derived from closer union and improved organisation, as set forth hereunder, may serve to advance it rapidly. The duty of arriving at a workable scheme of closer union lies primarily with the Department, acting in conjunction with the executives of the three Congresses the Congress of Farmers' Associations, the Agricultural Union Congress, and the Vine and Fruit-growers' Congress. Several schemes have been put forward, but the aim should be a number of carefully organised agricultural bodies acting in a large number of local matters as links between the Department and the farmers.

Assuming that this object will be reached, what benefits are expected? It should be the duty of the local association to intimate to the Department the needs of any section of the public it represents; but in any matter of general importance to the Colony the representation should come through the central Congress. This Department should not have to deal directly, for example, with a request from a private individual for an investigation of a certain disease or the trial of a new kind of wheat or an experiment in tobacco culture in a district. Matters of such general moment should first be discussed by the local body or by Congress, as the case may be, whose views should then be made known to the Department. Any information of benefit to a number of farmers should be communicated by the Department to the local association, which would then disseminate it. In other words, the correspondence of the Department on matters of general interest should be conducted as far as possible through local associations. At present the number of farmers belonging to agricultural associations are a small proportion of the whole—the 109 associations together have about 5,000 members—and this proposal of acting through the local association could not be entirely given effect to immediately on the attainment of re-organisation; but the private element would be gradually eliminated as the work of these associations render it worth the while of the farmer to become a member. This might be facilitated by aiming at development along the lines indicated in the following paragraphs:

1. The local association might act as the purchasers for members of articles required by a number of them, such as seed, fruit trees, agricultural machinery and implements, fencing material, manures, etc. It need hardly be mentioned that purchase in bulk and transport in bulk considerably lessens the cost and carriage of an article, sometimes as much as 33 per cent. At present the Government conveys, free of railage, sheep and cattle dips and dipping materials, and bone-meal for stock feeding. Requests are constantly received for the free railage of fencing material and manures, of insecticides for spraying fruit trees, of agricultural machinery, etc. In fact, the principle having been adopted in some respects, it is expected to be applied to every other farming requisite. Such assistance is wrong in principle, and should gradually be done away with in favour of a system of combined purchase and conveyance.

2. The local association might regulate in some respects the supply of produce to the market. It might also see to the grading and marketing of produce to ensure to purchasers a uniform quality. A system of grading and branding would enable the producer to take orders through an agent according to samples, and meanwhile to retain his produce on his farm instead of sending it to market without knowing in what state that market might be. It would be the duty of the Department to furnish information to local associations as to the condition of the market in any place, and the association could then regulate supplies accordingly.

3. The local association might arrange for periodical sales of produce. Mr. Dugmore's excellent proposal for the holding of public wool sales, where different wools would come into competition, and farmers might be educated by comparison of the wools on the market and the prices realised, and indifferent farmers taught the value of proper methods of skirting, sorting, etc., by receiving less for wools not properly prepared, would be rendered easily operative if there were organised bodies to arrange for such sales. The same applies to the sale of dried fruit, such as raisins, apricots, peaches, etc. At present education is afforded by shows, where producers can see the difference in the preparation and growth of various products;

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vines in which the infection was detected or suspected. Inspections revealed the extensive existence of the disease and its probable long presence in this Colony. Steps were then concentrated on the protection of the Western Province. On the one hand the Eastern Province urged relaxation of the restrictions, while on the other the Western Province pressed for greater stringency. The Transvaal and Rhodesia went further than we, and included in the infected area Districts in which the disease could not, after several careful inspections, be found. Their Regulations seriously affected both farmers and nurserymen. In July they relaxed their restrictions somewhat as regards farmers, but kept them up against nurserymen.

19. The first Locust campaign on a large scale in this Colony was initiated and carried out with marked success. The subject is fully dealt with in the report of the Government Entomologist.

20. Arrangements were made for the introduction from California of the Codling Moth parasite discovered by Mr. G. Compere, and for the importation of Blastophaga, the fig fertilising wasp.

21. Nurseries were inspected with a view to the suppression or extermination of insect pests.

22. The regulations under the Wine, Brandy, Whisky and Spirits Act, No. 42 of 1906, dealing with the registration of stocks in hand at the date of promulgation of the Act, were given effect to. As regards the prevention of adulteration, only preliminaries were arranged, owing to the absence of funds. The Act will be in full working early in 1908.

23. Committees, consisting of the Viticulturist attached to the Elsenburg Agricultural College and two farmers nominated by the local Agricultural Association, investigated the growth of American grafted vines in the Divisions of Worcester, Tulbagh, Robertson, and Montagu. The reports for the first two Districts were published in the *Agricultural Journal*, and the results of their enquiries gave general satisfaction. The further reports will be published later.

24. 925,355 American vine cuttings were distributed (at less than cost price) to aid farmers in the reconstitution of vineyards.

25. Arrangements were made for the continuation of their studies in viticulture by four young South Africans in Europe.

26. Dr. Perold was sent to Europe in October to study viticulture for a period of three years, after which he will return to the Cape as Government Viticulturist.

27. Four varieties of raisin producing vines were ordered from Spain.

28. The Fertilisers, Farm Foods, Seeds and Insecticides Act was passed, and regulations thereunder framed. These, however, were not issued. They will be promulgated about the middle of 1908.

29. Experiments with manures were conducted in a number of Divisions.

30. 39 tons of Arsenite of Soda, for destruction of Prickly Pear, were distributed at cost price.

31. The Divisional Council Act Amendment Act, 1907, giving greater power to such Councils for compelling the extirpation of noxious weeds, was proclaimed, up to the time of publication of this Report, in the Divisions of Aberdeen, Albert, Alexandria, Aliwal North, Bedford, Cradock, Colesberg, Fort Beaufort, Gordonia, Hay, Jansenville, Knysna, Komgha, Kuruman, Ladismith, Laingsburg, Malmesbury, Molteno, Mossel Bay, Murraysburg, Oudtshoorn, Paarl, Prince Albert, Queenstown, Riversdale, Robertson, Somerset East, Steynsburg, Stockenstrom, Swellendam, Tulbagh, Van Rhynsdorp, Vryburg, Willowmore, Wodehouse, and Worcester.

32. Experiments were conducted to ascertain the cheapest and most effective means of destroying prickly pear and jointed cactus. The results were eminently satisfactory.

33. About 11,000 persons were supplied gratis monthly with the *Agricultural Journal*.

34. The following weeds were proclaimed noxious in the Districts mentioned:

Jointed Cactus.—Cradock, Somerset East, Cathcart, Komgha, Jansenville, Steynsburg, Tarkastad, Bathurst, and Willowmore.

Dodder.—Jansenville, Tarka, Colesberg, Robertson, Uniondale, Prince Albert, Bedford, Middelburg, Worcester, Cradock, Graaff-Reinet, Steynsburg, Queen's Town, Albany, and Murraysburg.

Mexican Poppy (*Argemone mexicana*).—Stockenstrom, Fort Beaufort, Mafeking, and Steytlerville.

Spear Thistle (*Cnicus lanceolatus*).—Tarka.

Cockle Burr (*Xanthium strumarium*).—Fort Beaufort.

Saltwort (*Salsola kali* Linn.).—Uitenhage.

Amaranthus Weed (*Alternanthera achyrantha* R.Br.).—Somerset East, Upon the re-organisation of the Department in the middle of 1905 information was immediately gathered to ascertain the manner in which the various associations conducted their work, how they were constituted, and what work was accomplished by them. These enquiries were intended to be a preliminary step towards organising these bodies. Towards the end of that year a circular letter urging closer union was addressed to all the associations. The subsequent history of this movement is contained in the report of the Director of Agriculture for 1906. The principle of closer union is practically accepted by them, but on the question of the form which such closer union should take there is still great diversity of opinion. The object, however, is attainable, and I hope that the benefits which are anticipated to be derived from closer union and improved organisation, as set forth hereunder, may serve to advance it rapidly. The duty of arriving at a workable scheme of closer union lies primarily with the Department, acting in conjunction with the executives of the three Congresses—the Congress of Farmers' Associations, the Agricultural Union Congress, and the Vine and Fruit-growers' Congress. Several schemes have been put forward, but the aim should be a number of carefully organised agricultural bodies acting in a large number of local matters as links between the Department and the farmers.

Assuming that this object will be reached, what benefits are expected? It should be the duty of the local association to intimate to the Department the needs of any section of the public it represents; but in any matter of general importance to the Colony the representation should come through the central Congress. This Department should not have to deal directly, for example, with a request from a private individual for an investigation of a certain disease or the trial of a new kind of wheat or an experiment in tobacco culture in a district. Matters of such general moment should first be discussed by the local body or by Congress, as the case may be, whose views should then be made known to the Department. Any information of benefit to a number of farmers should be communicated by the Department to the local association, which would then disseminate it. In other words, the correspondence of the Department on matters of general interest should be conducted as far as possible through local associations. At present the number of farmers belonging to agricultural associations are a small proportion of the whole—the 109 associations together have about 5,000 members—and this proposal of acting through the local association could not be entirely given effect to immediately on the attainment of re-organisation; but the private element would be gradually eliminated as the work of these associations render it worth the while of the farmer to become a member. This might be facilitated by aiming at development along the lines indicated in the following paragraphs:—

1. The local association might act as the purchasers for members of articles required by a number of them, such as seed, fruit trees, agricultural machinery and implements, fencing material, manures, etc. It need hardly be mentioned that purchase in bulk and transport in bulk considerably lessens the cost and carriage of an article, sometimes as much as 33 per cent. At present the Government conveys, free of railage, sheep and cattle dips and dipping materials, and bone-meal for stock feeding. Requests are constantly received for the free railage of fencing material and manures, of insecticides for spraying fruit trees, of agricultural machinery, etc. In fact, the principle having been adopted in some respects, it is expected to be applied to every other farming requisite. Such assistance is wrong in principle, and should gradually be done away with in favour of a system of combined purchase and conveyance.

2. The local association might regulate in some respects the supply of produce to the market. It might also see to the grading and marketing of produce to ensure to purchasers a uniform quality. A system of grading and branding would enable the producer to take orders through an agent according to samples, and meanwhile to retain his produce on his farm instead of sending it to market without knowing in what state that market might be. It would be the duty of the Department to furnish information to local associations as to the condition of the market in any place, and the association could then regulate supplies accordingly.

3. The local association might arrange for periodical sales of produce. Mr. Dugmore's excellent proposal for the holding of public wool sales, where different wools would come into competition, and farmers might be educated by comparison of the wools on the market and the prices realised, and indifferent farmers taught the value of proper methods of skirting, sorting, etc., by receiving less for wools not properly prepared, would be rendered easily operative if there were organised bodies to arrange for such sales. The same applies to the sale of dried fruit, such as raisins, apricots, peaches, etc. At present education is afforded by shows, where producers can see the difference in the preparation and growth of various products;

VETERINARY CONFERENCE.

In March a Conference of representatives of the Veterinary Departments and of the Chief Inspectors of Sheep of the several South African Governments was held at Bloemfontein on the suggestion of this Department. A number of resolutions were adopted on the important question of the Inter-State removal of stock and the prevention of the spread of animal diseases by such removals. No practical result has, however, followed the Conference, as the various Governments interested adhered almost entirely to the *status quo ante*. Animal diseases are a South African question, and no uniformity in the matter of removal of stock is likely to be arrived at until there is one central administration to deal with it, which will take, in regard to diseases which are prevalent in all or nearly all the Colonies, and are not specially dangerous, the broad view with regard to British South Africa as one whole.

THE SCAB ACTS.

Many suggestions have from time to time been made for amending the Scab Acts in the direction of greater stringency. There can be little doubt that some amendments could be beneficially introduced. At the same time, no Scab Law can have the effect which the Legislature intends unless there is also efficient administration. At present the administration is deficient in three important respects, and until these defects are removed and the results have become apparent amendment of the Scab Acts will not avail much. The three defects referred to are:—

1. Ineffective supervision of the work of Inspectors;
2. The absence of sufficient inducement to Inspectors to do their work thoroughly; and
3. Needless inspections.

The areas to be supervised by the Assistants to the Chief Inspector are, on the whole, too large. If the Assistants cannot give close attention to the work of the Inspectors under them they might as well not be employed. As, however, it is impossible for a Chief Inspector himself to supervise the work of over 200 Inspectors, Assistant Chief Inspectors are absolutely necessary, but there should be a sufficient number of them; there should certainly be more than 13 (the present number) in the Colony proper in addition to the three in the Transkeian Territories.

As regards the Inspectors themselves, there is practically no promotion open to them at present; the salaries are not in proportion to the duties performed, and they have no hope that good work will be rewarded. There should be a system of scale increases on the following lines:—The initial salaries in the several districts should be in proportion to the amount of work to be performed. Inspectors should have scale increases of, say, £10 per annum, provided their work is efficiently performed. An Inspector who can show that his area has been free from scab for twelve months should be entitled to a double scale increment. When an Inspector arrives at the top of the scale he should, at the first opportunity, be transferred to an area to which higher pay is attached, and there likewise he should receive his scale increments. The additional number of assistants will afford an opportunity for more rapid promotion to an Assistant Chief Inspectorship. The salaries of the Assistants to the Chief Inspector should also be in proportion to the amount of work to be performed. These officers should receive scale increases on the same conditions as the Inspectors. Transfer from the area of one Assistant to that of another carrying a higher salary should take place whenever possible, so as to continue the opportunities for promotion. New appointments should always begin at the bottom of the ladder. Such opportunities for transfer would have a wholesome effect both as rewards held out for good service and as warnings to incumbents that their work may at a future date be reported on by those who may succeed them. So far as Inspectors are concerned, the co-operation of Scab Boards would be of value, as it would often be advisable to secure the transfer of an Inspector from one district to another on the ground of promotion, and, unless Scab Boards are prepared to accept the principle of transfer, the scheme may be largely rendered ineffective.

These proposals, if given effect to and if the present system of inspection be adhered to, would, of course, result in a large increase of expenditure. There are, however, a number of needless inspections at present which necessarily take up a great deal of an Inspector's time and render his services available for a smaller area than he ought to control. The fact that an owner reports an outbreak of scab should, for the Inspector's purpose, be sufficient proof of the existence of the disease on the owner's farm, and a personal inspection before quarantine should be made only in exceptional circumstances. There are also a number of careful owners who are themselves anxious to keep their flocks clean, and in whose case there is no necessity for close supervision. An

Inspector should so arrange his inspections that the careless farmer should receive his constant attention and the careful one be left as much freedom as the administration of the Scab Acts affords. Useless inspections only cause irritation. It is, therefore, possible to reduce the number of Inspectors and increase the extent of the areas of the remaining ones. This would result in a saving of expenditure more than sufficient for the appointment of more Assistants to the Chief Inspector and the provision of scale increases.

Assistants to the Chief Inspector of Sheep should also exercise all the powers of the Inspectors, that is, they should themselves quarantine and issue permits for removal when necessary. At present such work is left entirely to the Inspectors, even though they may have to travel long distances to do work which the Assistants when on the spot might do themselves.

Finally, the assistance of the Police should be invoked in order that there may be better control over the removal of infected stock. Inspectors should furnish the Police with the names of owners of infected flocks so that the surreptitious removal of sheep from a scab-infected flock may be detected more easily than at present.

ABOLITION OF DIP DEPOTS.

The Scab Disease Commission of 1892-1894 reported that "With very few exceptions, almost all witnesses examined approved of the Government establishing a dip depôt with branches throughout the country, either in charge of Resident Magistrates, Field-cornets, Dipping Inspectors or others, for the supply of efficient dipping material to flockmasters for dipping purposes at cost price to be forwarded over all Government railway systems free of carriage." This recommendation was embodied in Section 11 of the Scab Act of 1894 (No. 20), which provides, as regards depôts, that the Governor may establish one or more in every district for the sale of efficient sheep dips at cost price. This system was gradually extended until, in 1906, there were about 270 depôts in existence. In fact a number of wayside shops in practically every district had become depôts. When the depôt system was about to be instituted it was declared that the policy of the Government was to interfere as little as possible with trade conditions, and naturally the setting up of strictly Government Depôts, without giving storekeepers an opportunity of becoming agents, would have been considered a great interference with trade. The consequence of such a declaration of policy was the calling for public tenders. It was pointed out by dip firms that the dip trade had been conducted on a strictly cash basis and that they could not be expected to lock up a large amount of capital by stocking depôts where there might not be any demand for their dips. The then Under Secretary for Agriculture was deputed to meet representatives of the dip firms in order to make such arrangements as would induce dip importers to take full advantage of the depôt system. The outcome of the discussion was that the Government undertook liability for the dip sent to depôts. It was also decided that all approved dips should be entitled to be stocked at depôts.

The localities chosen for the establishment of depôts were fixed upon on local representations and on recommendations of Magistrates, Sheep Inspectors and the Chief Inspector of Sheep. When it was thought necessary to establish a depôt, tenders were invited for the sale of approved dips on payment by the Government of a commission. As a rule this commission was 5 per cent., and with few exceptions established merchants and storekeepers became the depôt agents. The commission paid by the Government to the depôt agent was supplemented by the importer, it is believed almost invariably, by a further commission of 10 to 20 per cent. The importers, until about two years ago, used the depôts as central stores from which they supplied merchants or other depôts. The result was that a number of depôts were overstocked and that the Government and the depôt agent and his sureties were liable for dip which might not be required in the locality in which the dip was stored. Amended regulations were then issued which provided that importers could not transfer dip from depôts to merchants or other depôts. As importers could send to depôt agents dips in any quantity without waiting for a requisition from the agents it happened that in many instances dips for which there was no local demand were lying at depôts for years. The Government, however, assumed no liability for depreciation or defective packing or ordinary leakage. Importers had also to insure their dip against fire. If a shortage at the depôt was discovered the depôt agent was called upon to pay the value and, if he could not pay, his sureties were called upon. Occasionally it happened that the depôt agent was unable to pay and that the sureties had become men of straw. The loss therefore fell on the Government.

It had been found in practice that no advantage accrued to the farmer by the existence of these depôts as the same dip was generally obtainable from merchants at the same price and even for less than at the depôts, owing to the fact that importers gave merchants a sufficiently large discount to enable them to compete with the depôt agents. The Government was, therefore, spending annually about £1,800 in the upkeep of the depôts without advantage to anybody but the depôt agents.

In 1895 there were 17 dips on the approved list, while in 1907 there were about 50, any of which, under the depôt system, could be sent to depôt agents. Some of these, though little used, were notwithstanding supplied to the depôts on the chance of the agent being able to effect a sale. There is no doubt that all these dips, although approved by the Government, are not of equal efficacy, and it is, of course, not desirable that any but the very best dips should be used.

For these reasons the depôt system was abolished. By doing away with the depôts dips which are not in great demand are not likely to be stored, and it may be assumed that the farmers' practical experience will lead them to demand none but the best.

VINEGAR AND THE WINE, ETC., ACT OF 1906 (No. 42).

During the last Session a Bill was introduced dealing, *inter alia*, with vinegar, and proposing certain amendments to the Wine Act with the object of making the latter more stringent.

With regard to the Wine Act, as it has not yet been fully enforced, its effect on the wine industry cannot yet be gauged. There is particular need, however, for an amendment in the following respect, namely:—Section 25 provides that stocks in the hands of merchants and holders at the time of the promulgation of the Act shall be allowed "sufficient" time for their disposal. So long as this provision remains it will be well-nigh impossible to trace the source of adulteration, and, therefore, to prosecute offenders. As far as I can judge this position is likely to continue for a considerable time, as it was alleged when the Act was promulgated that some retail dealers had certain stock which would last them five or six years. Wholesale merchants in Cape Town, however, all expressed themselves at that time in favour of fixing a time limit for the disposal of existing stocks, after which all adulterations detected could be regarded as contraventions of the Act. This suggestion was made in view of the fact that any regulations which would adequately control "existing stocks" would necessarily be irksome and irritating to dealers. Retail dealers strongly objected to a time limit, but they also appeared to be opposed to any legislation whatever on the subject of liquor adulteration. It is now fifteen months since the Act was promulgated, and the merchants referred to were quite agreeable at the end of 1906 to a time limit of one year being fixed. It would seem, therefore, that sufficient time has already been given for the disposal of existing stocks, and I would propose an amending Act providing that by the 30th September next all existing stocks shall be deemed to have been disposed of. If any retail dealers have existing stocks lasting five or six years, such stocks, it is more reasonable to presume, they would have difficulty to dispose of in any case. Moreover, it is hard to believe that retail dealers would have laid in stocks to last them for so many years, as that would amount to locking up their capital for a lengthy period.

With regard to vinegar it seems the lines of last year's Bill (which did not reach second reading) should be followed. In that Bill various kinds in use are defined. These definitions follow those in force in the United States of America. The addition of mineral acids or other ingredients injurious to health are prohibited, and the minimum acidity of any description of vinegar is fixed at 3½ per cent. The addition of any colouring matter to spirit vinegar or distilled vinegar, which in its natural state is colourless, is prohibited. The object of this is to obviate distilled vinegar, which may be derived from any other vinegar, being mistaken for wine vinegar. Next, the Bill requires that the labelling of all other vinegar shall be distinguished from that of wine vinegar, which alone may be sold under the name of "Vinegar" or "Wine Vinegar." Other kinds have to be prefixed by the name of the product from which they are derived. The buyer would, therefore, know what he is purchasing. This Bill does not propose to prohibit the sale of any particular kind of vinegar, unless it has too low an acidity, or is adulterated with a mineral acid, or contains colouring matter, or is not labelled to show what it is made of. The Bill rather intends to assist the buyer to know what he buys, and relies on the patriotism of the people to support wine vinegar. A large quantity of vinegar is made from acetic acid (of course imported) and water, with colouring matter added. The Bill does not prohibit the sale of such vinegar. It also makes no provision for it. But acetic acid vinegar could not, under the Bill, be sold simply as "vinegar." It would be for merchants to find for it a name which would not contravene the provisions of the Bill.

THE GOVERNMENT VITICULTURIST.

In October an agreement was entered into with Dr. I. Perold to undertake a thorough scientific and practical course of study of viticulture in Europe for a period of three years, at the end of which he will return to the Cape and assume the position of Government Viticulturist for a period of ten years, subject to certain conditions to safeguard the public interests.

VITICULTURAL STUDENTS IN EUROPE.

The four gentlemen who left here in August, 1906, for practical training in wine-making in the principal wine cellars in Europe and also to study cognac and raisin making, will return to the Cape early in 1909. They left the Rhine in August and proceeded to the Medoc to learn the manufacture of Claret and cognac, and will go, about the 1st April next, to Montpellier to study the methods adopted in France for testing the suitability of American stocks for particular soils and the results so obtained. About the middle of July two will proceed to Spain to learn sherry making, and two to Portugal to learn the manufacture of Port wine. On the completion of these labours they will inquire into the question of raisin-making in Spain, and thence go to Algeria on a brief visit, from where they will proceed to Marsala in Sicily to see the manipulation of wines in the depôts there.

DESTRUCTION OF VERMIN.

In connection with the Estimates for the present financial year a proposal that Divisional Councils should contribute towards rewards for the destruction of vermin was under consideration. In 1895, and for that year only, the Government paid rewards subject to the payment by a Divisional Council, a Poisoning Club, or other approved local body of amounts according to a certain scale. As the payments by Government were made dependent on contributions by a local body, and such contributions were voluntary, it followed that in some districts payments were made and in others not. There is no way of securing contributions from Divisional Councils uniformly throughout the Colony except either by their unanimous consent or by the passing of an Act compelling them to do so. Under present legislation, and as the principle embodied in the Government Notice of 1895 failed in its object, the only course short of compulsory legislation is for the Government to pay out rewards independently of Divisional Councils, and to urge all Councils to pay rewards in addition to those offered by the Government instead of making Government aid dependent on local contributions. On these lines new regulations were framed in September. Payments by Councils on the proofs submitted to Magistrates were provided for and, to avoid an applicant having to obtain rewards from two sources, it was arranged that Divisional Councils which might approve of making contributions could deposit with the Magistrates amounts to meet claims from Divisional Council sources.

As the whole skins have now to be produced as proof of destruction, no fraud can any longer be practised by claimants. As an inducement to Divisional Councils to contribute, the skins (minus heads and tails), which are returned to claimants, can be handed to Divisional Councils to recoup them at least partly for their expenditure. It does not appear, however, that any Divisional Council has fallen in with this proposal.

In its report of 1904, the Select Committee of the House of Assembly on the destruction of vermin said:—

> "The ultimate hope of the farmer lies in the erection of jackal proof "fencing. To the evidence on this subject your Committee would call special "attention. Fences of this description have already been erected by a few "farmers with eminently satisfactory results, as the evidence goes to show. "Such fences are costly, and the process of their erection will of necessity be "slow. . . . . The general adoption of a system of jackal proof fences "would do away with the ruinous practice of kraaling, the loss and damage to "the Colony resulting from which was made abundantly clear to your Com-"mittee. Amongst these may be enumerated:—The damage to stock from "the process of driving to and fro, and the consequent reduced increase; de-"terioration in quality and reduced weight of wool; the denudation of veld "through tramping; formation of footpaths which gradually by the action of "water, become worn into sluits; consequent rapid run off and imperfect pene-"tration and absorption of rainwater; consequent diminution of underground "water and drying up of springs; and consequent slow but sure, and already "perceptible, desiccation of the Karroo districts of the Colony."

Eradication of Scab also is largely dependent on the extermination of carnivorous jackals, owing to the necessity for kraaling as a means of preventing their depredations. The Select Committee reports both of 1896 and 1904 strongly insist on this view. On this point the report of 1896 says:—

> "For the Scab Act to be successful in eradicating scab, it is essential that "kraals should, to a large extent, cease to be used and the flocks left dispersed "in enclosures; but as shown above, this is impossible until the Carnivora are "destroyed."

But none of these considerations seem to me to be dependent on Government rewards for the destruction of wild carnivora. From the 1st September, when payment of rewards was resumed, to the 31st December, £306 was spent on this service as follows:—

Amount paid.	Animals paid for.	Reward per head.
£$20\frac{2}{5}$ ...	Red Cat (Lynx), 136 ...	3/-
$276\frac{3}{4}$ ...	Jackal, 1,845 ...	3/-
$8\frac{7}{10}$ ...	Baboon, 174 ...	1/-

For the year 1906, £12,332 was expended:—

Amount paid.	Animals paid for.	Reward per head.
£357 ...	Red Cat (Lynx), 2,041 ...	3/6
$11,733\frac{1}{2}$ ...	Jackal, 24,741 ...	10/-*
$241\frac{1}{4}$ ...	Baboon, 3,864 ...	1/6

* Pups, 2/6.

It is impossible to say whether the reduction of the rewards resulted in less animals being destroyed, or whether the rewards were too small to act as an inducement to many to claim them. The only fact to which one can point is that no complaint of an increase of vermin has so far been received, notwithstanding that payments were not made during the first eight months of the year.

The farmer's hope in saving his small stock from the depredations of wild carnivora lies, as is now the general conviction, in vermin proof fencing. Several suggestions have been made for the furtherance of this work. Some desire that the material for such fencing should be carried free on the Government railways. To this I am entirely opposed. The time seems, however, to have arrived for amending the Fencing Act of 1905 in the following direction, as has been suggested by some Farmers' Associations. The Act in question provides that the person erecting a vermin proof fence can call upon the adjoining occupier to bear his share of the cost only when the fence is of "beneficial use" to the latter. A farmer who desires to erect such a fence should have the power to call upon his neighbour to bear half cost just as in the case of ordinary fencing, since the need to prove beneficial use to the neighbour is not an encouragement to the erection of vermin proof fencing. As is indicated in the quotations from the reports of the two Select Committees there are so many large and important questions that go hand in hand with the suppression or extermination of the jackal pest that the granting of loans for the erection of vermin proof fencing deserves the most serious consideration.

PROHIBITION OF EXPORT OF OSTRICHES AND OSTRICH EGGS.

In the last Session a Bill was passed by Parliament to prohibit the export of any ostrich or ostrich egg to any place beyond the limits of this Colony or to any country separate therefrom by sea, provided that this prohibition should not apply in regard to any neighbouring Colony or State which should make similar legislative provision. This Act was promulgated immediately after, and correspondence was opened with the various South African Governments with the result that the following Colonies and States now prohibit the exportation of ostriches and ostrich eggs except to States in South Africa, which impose a similar prohibition, viz.:—Cape Colony, Natal, Transvaal, Southern Rhodesia, Basutoland, Bechuanaland Protectorate and Swaziland. Absolute prohibition has not yet been imposed by Mozambique, which Province, however, levies an export duty.

No measures have been taken yet by German South-West Africa or the Orange River Colony, but we do not enforce our law against the latter as it is surrounded by Colonies which prohibit exportation.

FISHERIES.

In consequence of the abolition of the office of Government Biologist, on 1st July, 1907, the work of scientific investigation of problems connected with the Fishing Industry has had to be discontinued. Tenders were invited for the hire of the Government Trawler S.S. "Pieter Faure," and the vessel has been leased to the

CAPE OF GOOD HOPE.

Report of the Department of Agriculture for the Year ended 1907, with Appendices.

Presented to both Houses of Parliament by Command of His Excellency the Governor

1908.

RESUME OF PRINCIPAL WORK DONE BY THE DEPARTMENT IN 1907.

1. The Animal Diseases Act Amendment Act, No. 16 of 1906, was enforced from the 1st March, 1907, but attention was specially devoted to stamping out lungsickness.

2. Experiments with lamziekte were conducted at Koopmansfontein, in Barkly West District. Important results have already been obtained. The work is drawing to a close as far as the Veterinary Department can carry the investigations. Bacteriological work requires to be done to complete the experiments.

3. Worms in ostriches are being investigated in Oudtshoorn District. For various reasons this work is not making the progress which was expected. It will be necessary to consider how it can be prosecuted with better promise of success.

4. Lungsick virus, redwater vaccine, mallein for testing glanders, and serum for inoculation of sheep against blue tongue (blaauwtong) were manufactured and sold. Sponsziekte and Anthrax vaccines were sold at cost price.

5. Investigations into the cause and prevention of bars in ostrich feathers were conducted by Professor J. E. Duerden, of Rhodes University College, Grahamstown, with the aid of a Government grant.

6. The borders between this Colony and the Transvaal and Natal were patrolled by Cape Mounted Police and Cape Mounted Riflemen respectively, the latter aided by native guards, to prevent the introduction of East African Coast Fever. The fences on these boundaries were kept in thorough repair, and the patrols were strengthened when required.

7. Investigations were conducted into the means of transmission of biliary fever of the horse, and of blue tongue (malarial catarrhal fever) of sheep; also to test the immunity or otherwise of woolled Persian sheep to heartwater

8. Contributions were made towards the construction of three cattle dipping tanks to the extent of half the cost, but not exceeding £75 per tank.

9. The carriage of bonemeal for feeding stock, as a preventive of lamziekte, was paid, with the object of inducing farmers to purchase it, especially those in the outlying Districts of Griqualand West and Bechuanaland, to whom the cost would otherwise be prohibitive.

10. One hundred and seventy-eight brands for animals were registered.

11. A Veterinary Conference was held at Bloemfontein, at which representatives of all the South African Colonies and States were represented, with a view to uniformity in inter-State regulations regarding animal diseases.

12. The importation of animals and plants was controlled to prevent the introduction of disease.

13. Localities were quarantined for various periods on account of animal diseases.

14. Demonstrations in wool skirting, sorting, rolling, etc., were given in a number of Districts.

15. The Dip Depôts, numbering about 270, were closed, resulting in a saving of expenditure of about £1,800 per annum, without disadvantage to the farmers.

16. An experiment was conducted to ascertain the effect of lime and sulphur on wool at the various stages of growth, and the fleeces sent to Bradford for report.

17. Experiments were begun, and in two instances completed, to ascertain how long scab-infected kraals harboured infection. In one instance infection was communicated to clean sheep six months after the kraal was last used, and in another instance twelve months after.

18. Plasmopara having been discovered in January, and investigated by the Transvaal Plant Pathologist, this Government was recommended by him to adopt most stringent measures for its eradication, even to the extent of destroying all

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AGRICULTURAL AND POULTRY SHOWS.

The grants in aid of these Shows was reduced by Parliament this year from about £13,100 to £5,000. The grants to Societies in aid of prizes at Shows had consequently to be reduced by approximately two-thirds. Formerly the Government contributions were a fixed amount in the £, so that the Government grant was in proportion to the local contribution. That system led to prizes awarded by some Societies being unduly high and acting as an inducement to exhibitors to participate in the Show for the sake of the prize money awarded rather than the honour of having gained the award.

The Parliamentary Vote is still distributed *pro rata* to the amount of the prize money awarded but is, as already indicated, a definite amount. It has also been made a condition of the Government subsidy that no grant shall be paid towards more than three separate Shows in any one season in respect of the same exhibit in the live-stock classes.

While the reduction of the Government grants was due to the need for restricting expenditure, and has seriously affected the financial position of some Societies, if it result in influencing Societies in the direction of large combined Shows, considerable benefit will arise from the step.

GUANO.

During the 1905 Session of Parliament a motion was carried requesting the Government to consider the expediency of reducing the price of guano, and in reply to a question asked later in the Session the then Secretary for Agriculture stated that the Government had decided to reduce the price (£6 10/- per ton) by ten shillings. In the next Session the following resolution was passed :—

> "That in the opinion of this House it is desirable that the Government should consider the question of the appointment of a Commission to enquire into and report upon all matters relating to the general administration and working of the Guano Islands, and the condition necessary for the best and cheapest utilisation and distribution of guano within the Colony."

The mover of this resolution made it clear that he wished the Commission to ascertain whether the Government could not reduce the price. A Commission was appointed accordingly which recommended, *inter alia*, that the surplus on the profit of the working of the Guano Islands after meeting the cost of a laboratory, to be provided and placed under the direction of an analyst who should be an officer of the Guano Department, be devoted to lowering the price of guano. The Commission in making this recommendation took into consideration the fact that as far as could be ascertained from various estimates which had been submitted the net actual cost of guano had been about £5 per ton, while the sale price was £6. These estimates, however, did not take account of several factors which have to be considered in arriving at the cost price, viz., administrative charges, risk of loss on account of rain or accident, interest on capital expenditure, depreciation of buildings and landing stages, wear and tear of the plant and the Government vessel employed in connection with the Islands, and the fact that a lowering of the price by £1 per ton, or 16%, would eliminate the margin of profit and would entail a loss, and, as the reduction would probably increase the demand, this would entail additional working expenses in order to endeavour to meet this demand, so that each additional ton sold would merely add to the loss incurred. If these be taken into consideration the price of £6 per ton does not appear to leave a large margin for contingencies.

P. J. DU TOIT.

Aplopappus Weed or Khaki Bosch.—Piquetberg and Paarl.

Rhenoster Bosch (*Elytropappus rhinocerotis*).—Colesberg.

35. The Governments of the Transvaal and Orange River Colony were induced to take steps to deal with noxious weeds in their respective Colonies, to render the work of eradication in Districts in this Colony along the Vaal and Orange Rivers more effective. Both these Colonies will propose to their Legislatures the necessary legislation.

36. Forty-four students received instruction at Elsenburg Agricultural College.

37. Turkish tobacco trials, under the supervision of Mr. Stella, were extended to ten localities, situated in the Divisions of Paarl, Ceres, Worcester, Riversdale, Mossel Bay, Caledon, Stellenbosch, Cape. The trials, begun at Frenchhoek in the latter part of the previous year, and concluded in the beginning of this, gave fairly satisfactory results.

38. Five hundred suckers of four varieties of Pineapples were imported for trial.

39. Experiments with citrus stocks were continued on Mr. P. J. Cillie's farm, Vruchtbaar, Wellington, at Messrs. Flanagan's farm, Prospect, Komgha, and at Elsenburg.

40. Practical demonstrations in the cultivation and pruning of fruit trees were given in a number of districts.

41. Government inspection and branding of export fruit was instituted, and practical instruction in the packing of such fruit given.

42. Trout ova and fry were distributed for stocking rivers, vleis, etc.

43. Little progress was made with the question of closer union of Agricultural Associations, but the matter was kept to the fore, and received the further consideration of the Department and the bodies concerned.

44. Thirty-six Agricultural, one Industrial, and eight Poultry Shows were subsidised.

45. The South African Products Exhibition held in London (23rd February to 13th March) and in Amsterdam (18th March to 2nd April) was participated in.

46. The Ostriches Exportation Prohibition Act was enforced, and the other South African Colonies and States have either taken or intimated their intention soon to take steps to pass similar legislation.

47. The Cape Stud Breeders' Association was given a further subsidy for the registration of pure-bred stock.

48. 5,238½ tons of guano were collected and 5,585¼ tons distributed. (A surplus from the previous year's stock was available for distribution.)

49. The Travelling Dairy Expert gave practical demonstrations in dairying in a number of districts and at certain Agricultural Shows.

REPORT OF THE ACTING UNDER SECRETARY FOR AGRICULTURE.

ORGANISATION OF AGRICULTURAL ASSOCIATIONS.

The proper organisation of these bodies appears to me to be one of the chief objects towards which the Department should direct its efforts at the present time. By the accomplishment of this the solution of a number of important practical questions will be greatly facilitated. A number of schemes have from time to time been considered, but the means of carrying them to fruition was often lacking. It is a commonplace that the Department is not sufficiently in touch with the farming community. There has been more contact between the two of recent years, but systematised labour on the part of agricultural associations I look upon as the chief means for attaining this purpose. It is obviously impossible to approach tens of thousands of individual farmers holding various opinions and having a multiplicity of needs. More than twenty years ago the first attempt at organisation was made by the creation of farmers' associations, but their efforts were neutralised by the import of politics into their work. In 1889 agricultural societies were organised for the holding of shows. A few years later other farmers' associations were established, the promoters of which confined themselves almost entirely to farmer's interests; and these are still in existence, and are a growing body, though the growth is slow. Fruit-growers' associations followed, dealing with the interests of Vine and Fruit-growers only. The Agricultural Commission of 1904-05 attempted to improve on these institutions by recommending, *inter alia*, the establishment of a local agricultural committee elected by the farmers in each fiscal division. Instead of recognising the existing bodies and endeavouring to improve their organisation, the Commission sought to impose an entirely new structure, and the attempt failed.

would require to remain on a very modest scale for many years to come, but in a general way it is but right to state that it would be infinitely more satisfactory to develop more fully the large and important agricultural industries which we possess than to multiply unduly large numbers of new ones, some of which have their novelty only to recommend them.

During the year there has been a considerable amount of activity in connection with agricultural education in one form or other. A short course for farmers was conducted by the Rhodes University College, Grahamstown, in which several members of the staff of this Department conducted classes. The Cape University has the establishment of a B.Sc., in agriculture at present under consideration. A former student of Elsenburg takes a class in elementary agriculture in a Public School in his vicinity, and an officer has been appointed in the Department of Public Education for the express purpose of advancing the cause of Nature study in our elementary schools. All this is particularly gratifying, and especially so when taken into consideration along with the fact that Elsenburg is overflowing. For the academic year beginning January, 1909, there are now only about six vacancies available, and even in our present financial condition, if we are to develop the country agriculturally, provision must be made elsewhere for the teaching of agriculture as at present conducted at Elsenburg College.

There is a crying need for a statistical branch, but I fear it is useless to suggest this, especially at the present time. We must not overlook the fact, however, that without statistics it is well nigh impossible to make sound progress. From the manner in which statistics have been collected in the past it is perfectly evident that the only way to secure reliable ones would be by legislation.

With regard to the development of the larger branches of our farming activity, there are several points which require very full consideration. In the case of cattle, much remains to be done by selection, and in management, both for milk and beef production. The yield of milk from our dairy stock is on average deplorably low, and if we could only bring home to the farmer the economic aspect of keeping and feeding one cow which would give as much as two do at present, it would do much to relieve the losses sustained during periods of great drought, because at present over-stocking is undoubtedly one of the chief causes of abnormal losses in such periods. The inferior quality of the animals kept is not, however, the only reason for such a state of affairs. Our population is small, our consuming power is accordingly very limited, and as a result of several good seasons, we get our markets so glutted and the prices become so low that farmers attempt to keep too many animals on their farms, rather than part with them at what they consider unremunerative prices. In the case of beef production, improvement does not lie so much in the direction of selection as management. We can grow as good beef as any part of the world, but there are few parts in which it is so lamentably handled. Our conception seems to be that an ox, to qualify for the butcher, must spend a long probationary period at the yoke, and then we wonder why people should perpetually grumble at the quality of our beef. While recognising the necessity for the use of the ox-wagon in many parts of the country, I fail to see why such a large proportion of cattle should have to undergo this training before being slaughtered. I fear it will remain so until the purchasers of slaughter stock begin to differentiate in price very materially between a young animal, which has been more or less continuously fed, and one which is so old as to make it impossible to give us good carcases. Speaking broadly, I should say that three-year-old beef should be worth to the consumer at least 25 per cent. more than the bulk of the commodity now put on the market, and so far as I am aware there is no difference made in the price paid for the two qualities at the present time. If the question of export should arise at any time, this is the first matter that must be attended to. As we have learned by bitter experience in other branches during the last two years, there is one way of making and retaining a world market, and that is by supplying only the best quality procurable.

In respect of sheep, the question of exporting is a problem which must be tackled earlier than the one just referred to, and it would be well if our large sheep farmers were to pay some attention to this matter, not that it is necessary actually to begin exporting, but to make some preparation in anticipation thereof. Our Department is now procuring particulars which will serve to guide those who might care to cater for this export trade. The economic advantages which would result from the export of surplus material need not be enlarged on, and those who intend going in for the trade need not expect fancy prices, but the aim of the legitimate producer should be not so much fancy prices as satisfactory ones, when dealing with large numbers of stock. Facilities should be offered to breeders of Persian sheep to induce them to send a trial shipment of Persian lambs to the Lonbut this education would be made far more effectual by the practical results at public sales, where producers of second and third rate articles would feel the loss sustained by them owing to indifferent manufacture or preparation by seeing more careful farmers realise better prices.

4. The local association might, as is done by the Bedford and Paarl Farmers' Associations, arrange for periodical sales of stock.

5. The local association might promote competitions in ploughing, harvesting, cultivating, pruning of fruit trees, spraying of fruit trees, etc., both to test agricultural machinery and appliances and create healthy rivalry among agriculturists.

This is, as will be apparent, an outline of a policy which the Department might follow in its dealings with farmers in matters which do not affect the individual only. It would take some time to reach the ideal. The existing bodies have been at work for years, and there is, therefore, every probability that they are going to continue to be a force in the country. Any organisation which does not recognise this is bound to meet with opposition from them; but if a sound scheme of re-organisation be agreed upon with them their support will no doubt be forthcoming. Co-operation so introduced would be a development of existing conditions, and not appear as a totally new factor super-imposed.

What are the benefits anticipated from such re-organisation?

Firstly, a closer relationship between the Department and the farmers and a better knowledge of their requirements.

Secondly, doing away with a number of doles in the shape of free railage and carriage, and substituting combination among farmers for cheaper purchase.

Thirdly, greater self-reliance among farmers.

Fourthly, the furnishing of ocular proof that the best methods pay best.

Fifthly, method in the marketing of produce.

Sixthly, a considerable saving in clerical labour in the Department.

AFRICAN COAST FEVER.

When this disease broke out in Zululand and Vryheid in May, 1906, steps were taken to regulate cattle traffic between Natal and the Native Territories. At first the introduction of all cattle from Natal was stopped, but, owing to representations from Griqualand East farmers, the prohibition was relaxed so as to allow transport oxen to travel between East Griqualand and Creighton, the rail-head in Natal. Owing, however, to the Native rebellion shortly after, the control of the disease in Natal got out of hand and transport oxen spread it as far south as Durban County. The Border was then closed altogether to cattle traffic between Natal and the Native Territories, and the prohibition was shortly after (in September, 1906) extended also to animal produce and grass-hay, in which the ticks which spread the disease are liable to be conveyed. As an additional safeguard the proper fencing of the Border and the patrolling of the fence were considered. A Rinderpest fence was in existence from the Drakensberg Range to Boshoff's Drift, the North-east boundary of Pondoland. That fence was put in thorough repair. Tenders were also called for the fencing of the portion of the Border from Boshoff's Drift to the sea, *i.e.*, the Pondoland border, about 60 miles in length. One hundred and thirty-five Native Police were enrolled to guard the Border. These Natives were placed under the forty-two C.M.R. stationed along the Border, who in turn were made responsible to the Magistrates of the Border Districts. The fencing of the Border from Boshoff's Drift to the sea would have cost about £3,300. As, however, the Umzimkulu River from where it leaves the Cape-Natal Border to the sea (*i.e.*, in Natal territory) could be more easily guarded than the Umtamvuna River, which forms the boundary between Pondoland and Natal, it was decided that it would be preferable to arrive at an agreement with the Natal Government that they should guard the Umzimkulu River, and include, within Cape Colonial territory for the purposes of this disease, Alfred County, which lies on this side of the Umzimkulu. The Natal Government having agreed to this proposal, it was given effect to, and since then (November, 1906) cattle have been moving freely, subject to certain supervision, between Alfred County and the Native Territories, cattle from any other part of Natal being, of course, rigidly excluded. The disease has since broken out twice in Alexandra County, immediately north of Alfred County, and, as the Natal Government has reduced its veterinary staff, the utmost vigilance on the part of the Cape and a complete reconsideration of its defensive measures are called for.

As regards the Transvaal the position is unchanged. The border is being vigilantly guarded by the Cape Mounted Police, who were further reinforced recently by a non-commissioned officer and twelve units.

Appendix I.

REPORT OF THE CHIEF VETERINARY SURGEON FOR THE YEAR 1907.

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I have the honour herewith to submit my Annual Report for the year ending the 31st December, 1907.

STAFF.

The following is the list of the Veterinary Officers at present serving on the Technical Staff:—

R. W. Dixon, M.R.C.V.S., Assistant Veterinary Surgeon	East London.
M. A. Hutchence, M.R.C.V.S., Assistant Veterinary Surgeon	Kokstad.
G. W. Freer, M.R.C.V.S., Assistant Veterinary Surgeon	Uitenhage.
J. Spreull, M.R.C.V.S., Assistant Veterinary Surgeon	Koopmansfontein.
J. A. Robinson, M.R.C.V.S., Assistant Veterinary Surgeon	Mossel Bay.
A. Goodall, M.R.C.V.S., Assistant Veterinary Surgeon	Worcester.
C. Goundry, M.R.C.V.S., Assistant Veterinary Surgeon	Aliwal North.
J. H. Lyons, M.R.C.V.S., Assistant Veterinary Surgeon	Grahamstown.
W. G. Pakeman, M.R.C.V.S., Assistant Veterinary Surgeon	Molteno.
S. Elley, M.R.C.V.S., Assistant Veterinary Surgeon	Oudtshoorn.
R. Paine, F.R.C.V.S., Assistant Veterinary Surgeon	Elsenberg, Mulder's Vlei.
P. X. Kearney, M.R.C.V.S., Assistant Veterinary Surgeon	Umtata.
W. Simson, M.R.C.V.S., Assistant Veterinary Surgeon	Mafeking.
W. Jowett, F.R.C.V.S., D.V.H., Assistant Veterinary Surgeon	Cape Town.
*R. W. Stephenson, M.R.C.V.S., Assistant Veterinary Surgeon	King Williamstown.
*J. A. Worsley, M.R.C.V.S., Assistant Veterinary Surgeon	Butterworth.

*Services started on 23rd March and 1st September, 1907, respectively.

I beg to thank the Professional and Clerical Staff for the manner in which they have carried out their duties, which has given me every satisfaction. During the year considerable changes took place in the Clerical Staff, and a loss was sustained to the Veterinary Branch by the retirement of Mr. F. du Plessis, who went on pension on the 31st October after thirty years' service, most of which time was spent in the Veterinary Branch. During his tenure of office he was regarded with affection by the whole of the Staff, and his services to them were highly appreciated, opportunity of his retirement being taken by the Veterinary Staff to present him with some tangible proof of their esteem for him.

CORRESPONDENCE.

Correspondence.	1907.	1906.	Increase.
Number of Letters, Telegrams, etc., received	9,117	7,174	1.943
Number of Letters, Telegrams, etc., despatched	5,506	5,092	414

STATISTICS.

Summaries of Animal Diseases Outbreaks during 1907.

As compared with 1906, there has been a total increase of 162 outbreaks of the various Animal Diseases scheduled under Act No. 27 of 1893. This increase is almost wholly due to the increase in the number of outbreaks of Lungsickness, amounting to 151.

Glanders shows an increase of 12 over last year, while Epizootic Lymphangitis and Tuberculosis have increases of 12 and 10 respectively.

Redwater and Scabies remain the same as for the preceding year, while Anthrax shows a decrease of 3, and Sponsziekte of 19 outbreaks.

There have been no outbreaks of Swine Fever this year.

The increase in the number of deaths amongst affected herds is due in the most part to Lungsickness, although Anthrax, Glanders, Redwater, Sponsziekte, Tuberculosis and Epizootic Lymphangitis also show increases in this respect.

The percentage and average number of deaths per outbreak is higher than last year in all the scheduled diseases, with the exception of Epizootic Lymphangitis, which shows a marked decrease. Glanders, although showing a higher average number of deaths, has a much lower percentage.

With regard to the percentage of average number of deaths, I would point out that the figures are worked out on the actual details as received from the Resident Magistrates of the various Districts, but in several cases it was found to be practically impossible to ascertain the exact number of animals concerned, more especially where many herds as in Native Locations were involved, and the percentage and average number of deaths per outbreak must therefore be taken as being actually lower than those shown in the attached tables.

General Summary of Animal Diseases showing the number of Outbreaks scheduled under Act No. 27 of 1893 during 1907, with comparative totals for 1906.

Month.	Anthrax.	Epizootic Lymphangitis.	Glanders.	Lung-sickness.	Red-water.	Scabies (Equine).	Sponsziekte.	Tuberculosis.	Total.
January ...	11	2	8	49	17	...	8	1	96
February ...	11	...	11	64	36	1	8	2	133
March ...	4	2	6	75	26	1	12	...	126
April ...	4	1	9	66	44	1	10	1	136
May ...	3	4	6	76	19	2	10	1	121
June ...	3	1	5	74	5	...	8	3	99
July ...	8	2	15	75	3	...	9	4	115
August ...	1	1	10	43	...	7	9	1	72
September ...	2	1	4	42	...	...	13	1	63
October ...	2	...	8	45	2	2	7	2	68
November ...	5	4	6	37	1	1	9	3	66
December ...	9	3	12	60	2	...	11	4	101
1907 ...	63	21	100	706	155	15	114	23	1,197
1906 ...	66	9	88	555	155	15	133	13	1,035

Return showing (1) total number of Animals concerned in outbreaks of Animal Diseases (Act No. 27 of 1893) in 1907; (2) Percentage of Deaths amongst Ditto; (3) Average number of Deaths per outbreak; (4) Comparative Figures for 1906.

Disease.	Number of Outbreaks.	Total Number of Animals.			Percentage of Deaths to Number of Animals in Herd.		Average Number of Deaths per Outbreak.	
		In Herd.	Inoculated, etc.	Died or Destroyed.	1907.	1906.	1907.	1906.
Anthrax	63	4,594	1,702	303	6·63	2·96	4·80	2·88
Epizootic Lymphangitis...	21	46	...	5	10·87	20·00	·23	·44
Glanders	100	940	638	193	20·53	25·62	1·93	1·87
Lung Sickness	706	35,528	14,696	1,821	5·12	4·01	2·58	1·94
Redwater...	155	6,195	702	347	5·60	4·64	2·23	1·81
Scabies (Equine)... ...	15	20	...	1	5·00	2·74	·06	·27
Sponsziekte	114	5,048	678	276	5·46	5·12	2·42	2·39
Tuberculosis	23	633	463	54	8·53	6·76	2·35	1·69
1907	1,197	53,004	18,879	3,000	5·66	...	2·49	...
1906	1,035	46,716	8,422	2,065	...	4·42	...	2·00

The attached tables showing the oversea imports and exports of Livestock may also prove of interest.

There is a very marked decrease in both imports and exports, the latter being probably chiefly attributed to the cessation of hostilities in German South-West Africa.

RETURN showing the quantity and value of Live Stock exported oversea from Cape Colony during 1907, with comparative totals for 1906.

DESCRIPTION.	1907.		1906.	
	Number.	Value.	Number.	Value.
		£		£
Horses	623	18,769	2,019	50,501
Mules	272	7,373	522	13,241
Donkeys	64	489	882	11,423
Cattle	596	9,164	8,643	142,438
Sheep	2,302	3,385	9,767	10,875
Goats	143	224	...	...
Pigs	2,167	6,069	2,121	6,181
Dogs	2	10	1	20
Poultry	10,499	1,990	...	1,950
Totals	16,668	47,473	23,955	236,629

The above figures were supplied by the South African Statistical Bureau.

RETURN of Live Stock examined and passed by the Veterinary Department into the Cape Colony, through the Ports of Cape Town, Port Elizabeth and East London from oversea during 1907, with comparative totals for 1906.

DATE.	Horses.	Mules.	Donkeys.	Cattle.	Sheep.	Goats.	Pigs.	Dogs.	Cats.	Monkeys.	Various	Monthly Totals.	
												1907.	1906.
January	118	...	...	4	227	2	...	12	4	...	...	367	1,577
February	154	73	...	40	37	...	3	40	1	...	...	348	1,315
March	5	...	...	8	372	...	3	20	...	...	...	408	437
April	208	8	...	5	11	...	...	11	...	...	...	243	2,114
May	6	...	...	12	72	...	...	10	...	...	...	100	956
June	154	...	4	12	17	...	17	9	1	...	34	248	228
July	318	60	...	4	14	...	...	8	...	...	...	404	1,050
August	26	...	1	45	210	...	...	8	...	4	...	294	521
September	456	80	...	6	6	...	1	18	...	...	...	567	311
October	70	...	...	20	169	...	1	18	1	2	5	286	381
November	9	...	...	35	67	...	3	18	...	...	...	152	478
December	49	4	2	14	20	...	17	18	4	...	...	128	1,076
Cape Town	1,556	225	7	131	274	...	36	154	10	6	38	2,399	9,247
Port Elizabeth ...	12	...	...	41	629	2	5	20	1	...	1	749	876
East London	5	...	...	33	319	...	4	16	...	...	...	377	321
Totals for 1907 ...	1,573	225	7	205	1,222	2	45	190	11	6	39	3,525	...
Totals for 1906 ...	2,979	4,101	989	912	955	46	51	332	21	7	51	...	10,444

ANTHRAX.

This disease during the past year has caused considerable loss amongst cattle, but fortunately does not prevail much in our small-stock farming area. I regret, however, that farmers do not avail themselves more readily of protective inoculation, which has proved such a success, the number of inoculations being only 5,500.

In connection with this disease, *Veterinary Surgeon Simson*, of Vryburg, reports:—

"Preventive inoculation has proved so satisfactory that it is done annually on many farms where deaths occurred in former years from this disease. In one instance that came under my observation many deaths occurred among a herd of cattle in the Dry Harts Valley, owing to the owner not detecting disease or reporting deaths; however, after inoculation the disease ceased."

And *Veterinary Surgeon Kearney*, Transkei:—

"These deaths occur so rapidly that there are great opportunities to conceal altogether or report 'Gallsickness,' and thus escape the inconvenience of the quarantine restrictions; as a consequence owners bear the loss, say nothing, and do nothing. As the quarantine which can be imposed here is ineffective, and as each place, in my opinion, is as much infected as another, I would suggest, if I might, that owners reporting the disease and having their cattle inoculated, should only be quarantined until the second vaccination had been completed. I think in this way owners would be encouraged to report and inoculate."

Anthrax.

District.	Outbreaks in 1907.												Total.	No. of Animals.		
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or Destroyed.	Inoculated, Tested, etc.
Albany	1	...	...	...	...	...	...	...	...	...	...	...	1	...	35	...
Alexandria	...	...	...	...	...	...	2	...	...	...	...	...	2	185	13	121
Barkly West	...	...	...	1	...	...	...	...	...	...	...	...	1	5	1	...
Ceres...	1	...	...	...	...	...	...	...	...	...	...	...	1	2	1	...
East London	...	...	...	...	...	1	...	...	...	1	...	2	4	121	5	...
Fort Beaufort	...	...	...	1	...	...	...	...	...	...	...	...	1	40	1	...
Hay	...	...	1	...	...	...	...	...	...	...	...	...	1	870	26	...
Herbert	...	...	...	...	...	...	...	...	1	...	...	...	1	52	2	...
Kenhardt	...	...	...	...	...	...	4	...	...	...	...	...	4	929	68	390
Kimberley	...	...	1	...	...	...	...	...	...	...	...	...	1	202	...	202
King William's Town ...	...	...	1	...	...	...	...	...	...	1	1	1	4	40	17	...
Keiskama Hoek	...	...	...	...	2	...	...	...	...	...	2	...	4	261	35	...
Knysna	...	1	...	...	...	...	...	...	...	...	1	...	2	332	13	319
Komgha	1	1	1	1	...	...	1	...	...	...	...	...	5	162	8	...
Kuruman	2	...	...	...	...	...	...	...	...	...	...	...	2	63	3	...
Mafeking	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...
Stockenstrom	...	...	...	...	...	...	...	...	...	...	...	1	1	1	1	...
Vryburg	...	1	...	...	...	...	...	...	...	...	...	...	1	670	29	670
Native Territories:																
Tembuland.																
Engcobo	...	...	...	...	...	...	...	...	...	...	...	1	1	131	13	...
Umtata	2	5	...	1	...	...	...	...	...	...	...	...	8	122	8	...
Transkei.																
Kentani	2	...	...	...	1	1	1	...	...	...	1	2	8	157	9	...
Nqamakwe	1	1	...	...	...	1	...	1	1	...	...	1	6	207	12	...
East Griqualand.																
Matatiele	...	1	...	...	...	...	...	...	...	...	...	...	1	21	1	...
Mount Currie	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Tsolo	...	1	...	...	...	...	...	...	...	...	...	...	1	20	1	...
Totals for 1907 ...	11	11	4	4	3	3	8	1	2	2	5	9	63	4,594	303	1,702
Totals for 1906 ...	8	5	9	5	5	5	2	3	2	5	14	3	66	6,418	190	1,514

EPIZOOTIC LYMPHANGITIS.

During the year twenty-one cases were reported, five of which died or were destroyed, the remainder recovering.

In connection with the treatment of this disease, *Veterinary Surgeon Freer*, Uitenhage, reports:—

"An outbreak of Epizootic Lymphangitis was also discovered at Humansdorp. In these cases, I find that the administration of Mercuric Potassium Iodide, combined with antiseptic local treatment, is effectual in 99 cases out of a hundred."

Epizootic Lymphangitis.

District.	Outbreaks in 1907.												Total.	No. of Animals.	
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or Destroyed.
Cape	...	...	1	...	...	1	1	1	...	...	2	...	6	6	2
East London	...	...	...	...	1	...	1	...	...	...	...	...	2	2	2
Humansdorp	1	...	...	1	3	...	...	...	1	...	...	1	7	8	...
Kimberley	...	...	1	...	...	...	...	...	...	...	...	...	1	1	...
Paarl...	...	...	...	...	...	...	...	...	...	...	1	1	2	4	1
Piquetberg	...	...	...	...	...	...	...	...	...	...	1	1	2	24	...
Stellenbosch	1	...	...	...	...	...	...	...	...	...	...	...	1	1	...
Totals for 1907 ...	2	...	2	1	4	1	2	1	1	...	4	3	21	46	5
Totals for 1906 ...	1	2	...	...	...	2	...	...	2	...	...	2	9	20	4

GLANDERS.

This disease now comes under the Animal Diseases Act, No. 16 of 1906, which provides:—

In the case of Glanders or Farcy:

(1) To cause the immediate destruction of the animal or animals found by the Board convened under section nine of the said Act to be visibly infected, compensation being payable to the owner of an amount not exceeding one-third of the value of the animal before infection, such compensation to be assessed by the said Board, and in no case to exceed £25 sterling for any one animal.

(2) To cause all animals which have been in contact with infected animals, and are liable to be infected, to be tested with Mallein by or under the supervision of a Government Veterinary Surgeon or other Officer thereto specially authorised in writing by the Minister, and to be isolated under quarantine.

(3) Any of the in-contact animals that react to the Mallein test must be isolated under quarantine and destroyed on developing the disease in visible form.

This Act has been found to give every satisfaction, and is greatly appreciated by horse-owners. Although the number of cases reported and dealt with seems large, I think we may be hopeful that the disease will soon be under control. The fact of compensation now being paid tends to early reporting of the disease and thus stopping its spread.

Veterinary Surgeons Goodall, Paine, Pakeman and Jowett report as follows:—

Veterinary Surgeon Goodall:—

"Glanders has been much less prevalent than in previous years, and I confidently think that the disease has now practically disappeared from the country districts of this area, although there is always the danger of re-infection from large towns. Owners cannot be too constantly impressed with the necessity for care in purchasing fresh animals, particularly from itinerant speculators, but I am glad to say that most people seem more awake to this fact than was formerly the case.

"I was called upon to deal with one or two bad outbreaks of Glanders in the Richmond District, and the infection was there traced to one animal, which had been purchased two or three years ago, and had gradually infected numbers of other animals. I also had one small outbreak in Laingsburg, attributable to 'outside infection.'"

Veterinary Surgeon Paine:—

"Only one outbreak has been brought to my notice, namely, in the Piquetberg District; in this outbreak there was evidence of farmers selling an obviously sick horse, it having passed through no less than five hands after it had developed definite lesions. This entailed the testing of 135 animals; 11 animals were found to be affected on the various farms, and several deaths had also occurred prior to my visits.

"In August I investigated a reported outbreak in Namaqualand, but found that the reports were incorrect."

Veterinary Surgeon Pakeman:—

"During the year twenty-four supposed outbreaks of Glanders I have had to deal with, thirteen of which proved to be the disease, involving the destruction of twenty-eight horses. The biggest outbreaks where the disease was supposed or did exist was at Barkly East, and here the disease had infected a number in a troop before reporting, the owner's belief being that his animals had a malignant form of Strangles. It was surprising to find that few precautions were and are taken as regards disinfection or isolation, although the owners in many cases had come to a conclusion that they had an infectious disease among their horses, but the exact nature of the disease they were unable to fathom. In one instance, which proved to be Glanders, the owner ran his infected horses in a camp separate from his trained horses during the day, but stabled them all at night together. The diagnostic symptoms of Glanders all were ignorant of."

Veterinary Surgeon Jowett:—

"In Cape Town and District but few outbreaks of this disease have occurred during the past year. Clinically affected subjects and those which re-act to Mallein inoculation are promptly slaughtered—all in-contacts are tested and the premises disinfected. This method answers very well, and the disease appears to be quite under control at the present moment.

"At the commencement of the past year it fell to my duty to deal with one or two considerable outbreaks of Glanders amongst horses and mules in the Caledon and Bot River Districts; as a result of my experience in these and other cases I arrived at the conclusion that:—

"1. When re-testing doubtful re-actors with Mallein, it appears unnecessary to delay the second test for a period longer than a few days, or in other words a period sufficiently long to allow of the return to normal of the temperature elevated in consequence of the first infection of Mallein.

"2. Of the two re-actions, thermic and local, the former appears to be the more delicate and precise, and the one less likely to lead to erroneous conclusions."

Glanders.

District.	Outbreaks in 1907.													No. of Animals.		
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	In Herd.	Died or Destroyed.	Inoculated, Tested, etc.
Albany	...	...	...	...	...	...	...	...	...	1	...	...	1	4	4	...
Albert	...	...	...	...	...	...	...	2	1	...	...	...	3	85	5	82
Alexandria	...	...	...	...	1	...	1	...	...	...	...	...	2	8	3	5
Barkly East...	...	...	...	1	...	1	1	1	...	3	...	...	6	94	19	25
Barkly West	...	...	...	...	...	...	...	...	...	...	1	...	2	5	2	...
Bedford	2	...	...	...	...	...	...	...	...	...	...	...	2	8	4	5
Caledon	1	1	4	...	...	...	...	...	...	...	...	...	6	25	6	20
Cape	1	1	...	...	2	1	...	1	...	...	...	...	6	36	13	30
Fort Beaufort	...	...	...	...	1	1	...	...	...	...	...	...	2	6	3	...
Hope Town	1	...	...	...	...	...	...	...	...	...	...	...	1	3	1	1
Kimberley	...	...	...	...	...	...	...	2	1	1	...	1	5	89	6	73
King William's Town ...	...		...	2	...	...	1	...	...	...	...	1	5	87	16	69
Komgha	...	...	...	...	1	...	...	...	...	...	...	1	2	3	3	...
Laingsburg	...	...	...	...		...	...	1	...	...	...	...	1	1	1	1
Mafeking	...	...	...	...		...	1	...	...	...	...	...	1	31	10	31
Malmesbury...	...		...	...		1	...	...	...	...	...	...	2	2	2	...
Murraysburg	...	...	...	1		...	...	...	...	...	...	...	1	2	2	...
Namaqualand	...	...	...	1		...	1	...	...	...	...	...	2	5	3	2
Oudtshoorn	...	1	...	1		...	...	...	...	...	...	...	2	6	5	...
Paarl	...	...	...	...		...	...	1	...	...	...	...	1	3	1	2
Peddie	...	1	...	...		...	...	1	...	...	...	2	4	4	4	...
Piquetberg	...	...	...	...		...	...	...	1	1	...	...	2	35	5	...
Port Elizabeth	1	...	...	...		...	...	...	...	...	...	...	1	5	2	4
Queenstown...	...	...	...	...		...	...	...	...	...	...	1	1	1	1	...
Richmond	...	...	...	...	...	...	4	...	...	...	...	...	4	41	11	36
Steytlerville...	...	...	...	...	...	...	...	...	...	...	...	1	1	5	5	...
Tarkastad	...	...	...	...	...	...	...	...	...	...	1	...	1	4	3	...
Tulbagh	...	1	...	...	...	...	...	...	...		...	...	1	8	3	...
Uitenhage	1	...	...	...	...	...	...	...	...		...	...	1	5	2	4
Uniondale	...	...	...	...	...	1	...	...	...		...	...	1	1	1	1
Victoria East	...	1	...	...	...	...	...	...	...		...	...	1	6	4	2
Willowmore	...	1	...	...	1	...	2	1	1	1	1	...	8	12	8	...
Wodehouse	...	...	...	...	...	...	...	...	...		1	1	2	33	3	...
Transkeian Territories																
Tembuland.																
Elliotdale	...	...	...	1	...	...	...	...	...				1	1	1	...
St. Mark's	...	...	1	...	...	...	...	...	...				1	6	1	...
Umtata	...	...	...	...	...	...	2	...	...		1		4	233	14	233
Transkei.																
Port St. John's	...	...	...	...	...	...	2	...	...			1	3	8	2	...
Pondoland.																
Flagstaff	...	...	...	...	...	...	...	...	...	...	...	1	1	2	...	...
Ngqeleni	...	...	...	...	...	...	...	...	...	...	...	1	1	7	1	7
East Griqualand.																
Qumbu	...	...	1	2	...	...	...	...	...	...	...	...	3	7	4	5
Matatiele	1	...	...	...	...	...	...	...	...	...	...	...	1	5	3	...
Mount Frere	...	1	...	...	...	...	...	...	...	...	...	...	1	1	1	...
Tsolo	...	...	...	...	...	...	...	...	...	1	1	...	2	6	4	...
Umzimkulu	...	1	...	...	...	...	...	...	...	...	...	...	1	1	1	...
Total for 1907	8	11	6	9	6	5	15	10	4	8	6	12	100	940	193	638
Total for 1906	12	6	8	7	5	6	9	9	5	7	4	10	88	644	165	490

LUNGSICKNESS.

The Animal Diseases Act Amendment Act No. 16 of 1906 was promulgated to take effect in the Colony proper on February the 1st, on which date a start was made to eradicate this disease. The Act provides for the slaughter of all infected animals and the inoculation of all in-contacts, with compensation for those slaughtered of an amount equal to one half of the value of the animal before infection. After eleven months' trial of the new Act, from the results obtained, I think it can be claimed that considerable progress has been made towards the eradication of the disease within Cape Colony. During the month of December only fourteen fresh outbreaks were reported, involving six Districts; seeing that the disease has been prevalent in twenty districts during the year, such a state is so hopeful as to enable us to continue our combat with the disease with renewed energy.

The great danger of re-infection to which the Colony is subjected by the adjoining Territories of the Transkei, will necessitate further restrictions being placed on transport oxen from those Territories. The compulsory slaughter of infected animals not being in force in the Transkei, animals are allowed to recover and become a source of great danger when used as transport oxen to and from the Colony. In the Transkei inoculation with prepared and crude virus was resorted to, with, on the whole, marked success. The inoculations performed by Government Inoculators numbered 107,010, and as there were a large number of officially recognised private inoculators, whose returns are not included, the inoculations performed must total at least 300,000.

In connection with Lungsickness, *Veterinary Surgeon Dixon* reports:—

"After nearly twelve months' experience of the working of the new Act, I can with confidence express an opinion on the beneficial results that have been obtained throughout this area, by reducing the number of outbreaks of Lungsickness.

"In the East London District the number has been reduced by nearly one-half.

"Taking the figures, the results from King William's Town District are not so good, for there are more outbreaks recorded this year than last. Still the good work done here during the past year will, I believe, cause a marked decrease in the number next year, as systematic inoculation of all cattle suspected to have come in contact with infected stock has been carried out throughout the District, thereby protecting the cattle from fresh infection.

"The outbreaks in this District have principally been amongst Native cattle grazing on large locations, and I have found it often most difficult to stamp out Lungsickness in Native locations where numbers of cattle belonging to many owners congregate, and where I suspect the quarantine restrictions are frequently evaded.

"The Native custom of Lobole is a source of great danger by spreading this disease, for fresh cattle are often introduced into Lungsick areas, thereby keeping the infection alive or taken out of an infected area and so spreading the disease. I fear this often happens in Native Districts.

"In the Komgha District the outbreaks have been reduced nearly one-third, and it is a hopeful sign that the disease is being gradually stamped out in this District to notice that only two fresh outbreaks are reported for November and December. I consider that under the new Act the best results have been obtained in this District, seeing that the District is inhabited by many transport riders, both European and Native, that large numbers of cattle are owned by Natives and are scattered all over the District, and also taking into consideration its near position to the Transkei.

"A large share of the credit for reducing the spread of Lungsickness is due to the Resident Magistrate, Komgha, who has taken a most active interest in this matter, has rendered me every assistance, and seen that the Act has been properly enforced.

"In the Stutterheim District four outbreaks have occurred amongst Native stock on farms bordering the Kei and Kubusie Rivers. One farm at present still being in quarantine. There was also one outbreak in the Cathcart District, which is now reported clean, and has been released from quarantine."

Veterinary Surgeon Kearney, Transkei:—

"The greatest misfortune, and I consider the greatest reason for the continuance and spread of the disease in these parts, is the fact that the Native will not isolate his sick from his healthy cattle; the marvel to me is that the losses are not greater. Frequently on going to inoculate I have seen sick cattle—and these were well known to be sick—in the same kraal (and these kraals are very small) with the healthy cattle, they graze together and are kraaled at night together.

"On one occasion I had a Native Constable stationed at the kraal to insist that the sick ones were kept isolated and tied up, but on making a surprise visit the dusky Constable could not be found—beer-drinking, I suppose—and a sick beast was standing loose alongside the road. As a rule, the Native laughs at the idea of isolation, and argues that there is no use in him isolating and tying up sick animals, as his neighbour will allow both his healthy and his sick cattle to mix with his.

"In many ways the epidemic has been remarkable, but in none more than in the varying results of Caudal inoculation. It is safe to say that in comparatively few cases only did the signs of 'taking' occur within ten days, whether the virus used was 'local' or prepared, and in my experience I found about the 14th day the most critical time, and from that day on to the fourth week and longer the person attending to the tails had an exceedingly busy time. In a very considerable number of cases, with absolutely no sign whatever about the tail, the glands at the root of the tail swelled up with a large inflamed area around them, and these cases, unless treated immediately, continuously, and drastically—I found blistering severely with Ung Hydrarg biniod—1 to 4 very good—generally proved fatal. In these cases again the Natives generally wait until it is too late before reporting them or dealing with them."

LUNGSICKNESS.

DISTRICT.	Outbreaks in 1907. Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total.	No. of Animals. In herd.	Died or Destroyed.	Inoculated, Tested, etc.
Bathurst	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Cathcart	...	...	...	1	...	...	...	...	...	...	...	...	1	68	4	67
East London	6	3	7	5	3	2	4	3	8	2	2	...	45	1,980	115	467
Fort Beaufort	...	1	...	1	...	...	...	...	...	...	...	...	2	121	6	115
Gordonia	...	4	2	3	2	3	8	...	6	1	1	4	34	2,039	101	775
Hay	...	1	...	1	...	1	1	...	...	...	...	...	4	147	15	116
Kenhardt	...	...	2	2	1	2	...	1	...	...	...	...	8	210	50	50
Kimberley	...	...	...	...	...	...	...	...	...	...	1	...	1	26	2	...
King William's Town	5	6	7	2	5	3	4	3	2	2	2	4	45	3,395	79	1,920
Keiskama Hoek	...	...	...	...	...	...	...	...	...	1	...	...	1	9	1	...
Middledrift	1	...	...	1	1	2	...	1	...	...	...	...	6	200	13	177
Komgha	5	4	9	6	4	3	5	3	3	3	1	1	47	3,885	141	2,732
Kuruman	1	2	...	...	...	...	...	...					3	144	3	...
Mafeking	...	...	...	...	...	...	1	...			1		2	98	2	...
Namaqualand	...	...	4	...	5	...	1	4	3	3	2	2	24	1,455	92	630
Peddie	1	5	1	...	4	1	...	...	2	1		2	17	949	33	286
Prieska	1	1	...	...	1	...	1	...		2			7	686	47	201
Stockenstroom	...	...	1	...	...	...	...	...					1	87	6	...
Stutterheim	...	...	2	...	...	1	1	...					4	419	19	43
Vryburg	...	...	...	...	6	1	1	1		1	2		12	859	19	679
Transkeian Territories— *Tembuland:*																
Elliotdale	...	1	1	...	1	2	...	...		1	1		7	123	24	37
Engcobo	1	...	5	2	3	2	5	3	2		1	3	27	1,147	48	542
Mqanduli	1	...	...	...	...	5	...	...	...	1	1		8	400	16	46
St. Marks	...	1	1	...	1	1	...	...	...	...	...		4	87	4	9
Umtata	8	6	4	4	3	6	1	2	...	1	1	1	47	1,832	75	576
Transkei:																
Butterworth	1	4	3	2	9	2	6	1	2	...	3	2	35	1,292	111	573
Idutywa	...	...	1	...	...	...	1	...	...	...	...	...	2	98	6	18
Kentani	4	6	11	6	6	7	11	7	1	5	3	3	70	1,685	161	778
Nqamakwe	3	6	4	7	1	9	4	...	4	6	2	3	49	1,952	67	512
Tsomo	...	1	...	...	1	4	...	...	...	...	1	2	9	306	20	110
Willowvale	2	2	3	6	7	3	3	...	...	...	...	...	26	1,314	95	425
Pondoland:																
Bizana	...	...	...	...	2	...	...	2	...	...	...	...	4	208	25	73
Flagstaff	...	...	1	...	...	...	...	...	...	...	...	...	1	276	2	...
Libode	...	...	...	1	...	2	...	...	...	...	...	3	6	558	57	...
Lusikisiki	1	...	...	...	1	...	...	...	...	...	...	1	3	202	20	95
Ngqeleni	...	...	...	...	3	...	2	3	6	4	3	1	22	855	22	443
Tabankulu	...	...	...	1	1	3	3	...	...	1	2	7	18	1,750	35	714
East Griqualand:																
Mount Ayliff	...	...	1	...	...	...	...	...	...	...	...	...	1	60	3	...
Mount Currie	...	...	...	...	1	...	...	...	...	...	...	...	1	54	1	...
Mount Frere	5	2	1	4	2	3	4	1	1	...	2	...	25	1.507	47	532
Qumbu	1	5	3	7	2	5	3	4	...	10	3	4	47	1,874	141	592
Tsolo	2	3	1	4	...	1	5	4	1	...	2	6	29	1,171	93	363
Totals for 1907	49	64	75	66	76	74	75	43	42	45	37	60	706	35,528	1,821	14,696
Totals for 1906	31	26	24	31	47	58	64	61	46	63	55	49	555	26,914	1,080	5,062

QUARTER EVIL (SPONSZIEKTE).

It is encouraging to notice the increased desire to make use of protective inoculation, 9,640 doses having been used last year. I have no sympathy with those farmers who will persist in waiting for a case before resorting to inoculation, as is so frequently done. These protective inoculations should be attended to at the proper time, just as the sowing of the mealie crop or mating of the stock.

Veterinary Surgeon Robinson, Mossel Bay, reports:—

"Other infective diseases which have come under my notice are Anthrax and Sponsziekte, and there seems to be an increased desire to take advantage of the preventive measures in connection with them. In the District of Riversdale Sponsziekte causes the deaths of hundreds of young cattle every season, and I trust that, inoculation for it having now been commenced there, it will be generally adopted by the farming community."

Veterinary Surgeon Kearney, Transkei:—

"These deaths occur so rapidly that there are great opportunities to conceal altogether or report 'Gallsickness,' and thus escape the inconvenience of the quarantime restrictions; as a consequence, owners bear the loss, and say nothing and do nothing. As the quarantine which can be imposed here is ineffective, and as each place, in my opinion, is as much infected as another, I would suggest, if I might, that owners reporting the disease and having their cattle inoculated, should only be quarantined until the second vaccination had been completed. I think in this way owners would be encouraged to report and inoculate.

"Towards the end of the year very serious losses from Quarter Evil have occurred about Umtata, and I have inoculated many herds with the different forms of the vaccine, and from what I can hear up to the present, with very good results. I prefer the Blacklegoids, as the simplest method, providing their quality can be depended upon.

"I am making every endeavour to point out to owners here the necessity for inoculating their young stock annually as they come on, and thus not only save their stock, but prevent the more and more extended infection of the veld which is now going on, with its certain legacy of future loss."

Veterinary Surgeon Simson, Bechuanaland:

"Preventive inoculation has also proved so satisfactory that it is done annually on some farms."

QUARTER EVIL (SPONSZIEKTE).

DISTRICT.	Outbreaks, in 1907.												Total.	No. of Animals.		
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or Destroyed.	Inoculated, Tested, etc.
Albany	...	...	...	...	...			1	...	...	...	...	1	50	1	49
Albert	...	...	...	...	...			...	...	1	...	...	1	50	2	...
Alexandria	...	...	...	...	...			...	...	2	2	1	5	228	9	17
Aliwal North ...	1	...	1	1	...			...	2	...	...	...	5	379	12	...
Barkly East ...	...	...	...	1	...		2	...	...	...	...	1	5	287	18	149
Bathurst	...	...	...	...	1	...		...	...	...	...	...	1	3	3	3
East London ...	...	...	...	1	...	...		...	4	2	3	...	10	376	25	...
Fort Beaufort ...	...	...	...	...	...	1		1	...	...	...	...	2	153	5	144
Herschel	1	4	4	3	2	3		...	5	...	1	1	25	636	47	8
Humansdorp ...	...	...	...	...	1	...		5	...	...	...	...	6	85	7	...
King William's Town	...	...	...	1	2	1		1	1	1	1	2	11	1,013	19	126
Keiskama Hoek ...	...	...	...	...	...	1		...	...	...	...	...	2	88	3	...
Komgha	...	...	...	...	...	...		...	...	...	...	...	1	25	3	...
Peddie	...	...	2	...	...			...	...	...	1	...	3	185	5	...
Stockenstrom ...	...	...	...	...	...		...	...	...	...	...	1	1	190	7	182
Stutterheim	...	...	1	...	...		...	...	...	...	...	...	i	94	4	...
Victoria East ...	...	...	...	1	...		...	...	...	...	...	...	1	28	1	...
Native Territories—																
Tembuland :																
Elliot	...	...	...	...	...	...	...	...	...	...	...	2	2	46	3	...
Elliotdale	...	1	...	...	1	...	...	...	...	...	...	...	2	35	6	...
Mqanduli	...	...	...	...	...	1	...	...	...	...	...	...	1	43	4	...
Umtata	...	1	1	1	1	...	...	...	...	...	...	2	6	364	22	...
Transkei :																
Butterworth ...	1	...	...	...	...	...	...	...	...	...	...	...	1	30	15	...
Kentani	1	...	1	...	1	...	2	1	...	...	1	1	8	103	10	...
Nqamakwe	...	1	...	...	...	...	...	...	...	...	...	...	1	105	6	...
Willowvale	2	...	1	1	1	...	1	...	1	...	...	...	7	293	12	...
Pondoland :																
Libode	...	1	...	...	...	...	...	...	...	...	...	...	1	...	17	...
Lusikisiki	2	...	...	...	...	...	...	...	...	1	...	...	3	122	8	...
East Griqualand :																
Matatiele	...	...	1	...	...	...	...	...	...	...	...	...	1	37	2	...
Totals for 1907 ...	8	8	12	10	10	8	9	9	13	7	9	11	114	5,048	276	678
Totals for 1906 ...	3	18	23	9	12	12	7	5	6	9	17	12	133	6,199	318	614

REDWATER.

Inoculation against this disease has been carried out extensively, and with good results, on Colonial-bred cattle, but the inoculations of imported stock is still accompanied with considerable loss.

Veterinary Surgeon Robinson reports as follows, and also states that further investigation is required on certain lines suggested by him, which, unfortunately, we are unable to take up at the present time:—

"This disease is the one to which I have devoted most attention during my ten years' residence in the South-western Districts. From the time of its first appearance in Knysna in August, 1898, it made steady progress, extending in a westerly direction to Mossel Bay. Last season its progress appeared to have become arrested, and this year so far no advance has been made. The whole of the grass veld of George, Knysna, and Mossel Bay is now an immune Redwater area, no uninoculated animal being able to live there during the tick season, but in the coast area of Mossel Bay Redwater has not spread to any extent, only an occasional case occurring after heavy rains in the summer. A remarkable fact, of which I am unable to give a reasonable explanation, is that although Redwater was introduced into Riversdale in 1903, and several outbreaks occurred in various parts of the District, it has not spread, and even on farms where all cattle were inoculated the disease has disappeared, and fresh animals can be brought in without risk. This occurs on sour veld farms under the Outeniqua Mountains, and on which the common Blue Tick (*R. decoloratus*) is plentiful, and is exceedingly difficult to account for. Inoculation for Redwater has been of the greatest possible service to owners of cattle in this area during past years, and it has been the means of preventing absolute ruin to many comparatively poor men engaged in transport of wood in George and Knysna and general merchandise between Mossel Bay and Oudtshoorn, but as all cattle bred in the Redwater area acquire immunity at an early age, it is now only made use of for treatment of cattle introduced from non-infected Districts, either for transport or dairy purposes."

REDWATER.

DISTRICT.	Outbreaks in 1907.												Total.	No. of Animals.		
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or Destroyed.	Inoculated, Tested, etc.
Albany	3	...	1	2	...	...	...	...	...	...	...	...	6	171	7	106
Bathurst	1	2	...	...	...	...	...	...	...	...	...	...	3	...	2	...
Cathcart	...	...	...	2	1	...	...	...	...	...	...	...	3	140	22	...
Fort Beaufort	...	1	3	3	1	...	...	...	...	...	...	...	8	506	16	...
Glen Grey	...	...	...	2	4	...	...	...	...	...	...	...	6	138	15	...
Herschel	...	...	...	...	3	2	...	...	...	...	...	...	5	160	8	...
Humansdorp	1	5	6	5	...	...	...	...	...	...	...	...	17	855	51	448
King William's Town ...	...	1	1	...	...	...	...	...	...	...	...	1	3	425	4	...
Middledrift	...	...	...	...	...	...	...	...	...	...	1	...	1	11	1	...
Oudtshoorn	...	1	3	6	...	1	...	...	...	...	...	...	11	169	20	21
Peddie	...	1	...	...	...	...	...	...	...	...	...	...	1	35	...	...
Port Elizabeth	...	...	...	...	1	...	...	...	...	...	...	1	2	67	3	...
Queenstown	1	...	1	...	...	...	...	...	...	...	...	...	2	182	37	...
Somerset East	...	...	...	...	1	...	...	...	...	...	...	...	1	...	11	...
Stockenstrom	...	...	...	1	...	...	...	...	...	...	...	...	1	3	2	...
Stutterheim	...	1	...	...	...	...	...	...	...	...	...	...	1	...	2	...
Uitenhage	1	6	...	...	...	...	...	...	...	...	...	...	7	551	19	...
Uniondale	...	1	...	...	...	...	...	...	...	...	...	...	1	38	1	...
Victoria East	...	...	2	...	...	...	...	...	...	1	...	...	3	82	6	78
Wodehouse	...	...	2	1	...	...	...	...	...	...	...	...	3	49	5	...
Transkeian Territories.																
Tembuland.																
St. Marks	3	7	2	18	5	1	...	...	...	...	...	...	36	832	56	...
Umtata	2	...	...	1	...	1	...	...	...	...	...	...	4	98	9	49
Transkei.																
Kentani	1	...	...	...	...	...	...	...	...	...	...	...	1	8	1	...
Nqamakwe	...	2	1	2	3	...	...	...	...	...	...	...	8	475	9	...
Tsomo	1	3	...	...	...	...	...	...	...	...	...	...	4	135	10	...
Pondoland.																
Flagstaff	1	...	2	1	...	...	...	...	...	1	...	...	5	723	14	...
Tabankulu	1	...	...	...	...	...	...	...	...	...	...	...	1	94	1	...
East Griqualand.																
Matatele	...	...	2	...	...	...	...	...	...	...	...	...	2	58	2	...
Mount Ayliff	...	1	...	...	...	...	...	...	...	...	...	...	1	31	6	...
Mount Fletcher	...	...	...	...	...	...	3	...	...	...	...	...	3	...	...	...
Tsolo	1	4	...	...	...	...	...	...	...	...	...	...	5	159	7	...
Totals for 1907	17	36	26	44	19	5	3	...	...	2	1	2	155	6,195	347	702
Totals for 1906	16	48	29	11	21	4	4	3	...	3	8	8	155	6,049	281	439

SCABIES.

The number of cases reported is the same as in 1906, but it is feared that all cases, especially in the Transkei, are not reported; steps are, however, being taken to enforce the notifying of outbreaks.

SCABIES (EQUINE.)

DISTRICT.	Outbreaks in 1907.												Total.	No. of Animals.	
	Jan.	Feb.	Mar	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or destroyed.
Cape	...	1	1	1	...	...	...	1	...	1	1	...	6	8	1
Humansdorp	...	...	...	...	...	...	...	2	...	...	...	...	2	4	...
Komgha	...	...	...	...	...	...	...	3	...	...	...	...	3	4	...
Uitenhage	...	...	...	...	2	...	...	...	...	...	...	...	2	2	...
Native Territories—Transkei.															
Nqamakwe	...	...	...	...	...	...	...	1	...	1	...	...	2	2	...
Totals for 1907	...	1	1	1	2	...	...	7	...	2	1	...	15	20	1
Totals for 1906	...	1	...	...	2	4	...	1	...	1	6	...	15	146	4

TUBERCULOSIS.

Twenty-three outbreaks have been dealt with during the year, involving the tuberculin testing of 633 animals, 54 of which re-acted, and were destroyed. It is intended shortly to examine all the cattle in the Cape Peninsula, and, where necessary, submit them to the tuberculin test. In connection with the importation of animals from oversea, it is found that it will be necessary to quarantine and submit all imported breeding stock to the test, even although accompanied by a Tuberculin Certificate, some of which animals on being tested on arrival being found to be infected with the disease.

Veterinary Surgeon Dixon reports:—

"When slaughtering cattle affected with Lungsickness I have found on several occasions Colonial oxen showing tubercular lesions, these cases having been confined cattle in the East London and Komgha District, and the source of infection has been traced to association with Madagascar oxen."

TUBERCULOSIS.

DISTRICT.	Outbreaks in 1907.												Total.	No. of Animals.		
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.		In Herd.	Died or destroyed.	Inoculated. Tested, etc.
Bedford	...	...	...	...	...	...	1	...	...	...	...	...	1	54	1	53
Caledon	...	...	...	...	...	1	...	...	...	...	...	...	1	60	5	60
Cape	...	1	...	1	...	1	1	1	...	1	1	3	10	34	19	34
East London	...	1	...	...	...	...	...	...	...	...	...	...	1	8	2	6
King William's Town	...	...	...	...	...	...	...	...	...	1	...	...	1	100	1	...
Komgha	1	...	...	...	...	...	...	...	...	...	...	...	1	60	4	...
Malmesbury	...	...	...	...	...	...	...	...	...	...	1	...	1	130	14	130
Paarl	...	...	...	...	...	...	...	...	...	...	...	1	1	41	...	41
Piquetberg	...	...	...	...	...	1	...	...	...	...	...	...	1	17	3	16
Port Elizabeth	...	...	...	...	1	...	...	...	...	...	...	...	1	4	1	4
Stellenbosch	...	...	...	...	...	...	2	...	1	...	1	...	4	125	4	119
Totals for 1907	1	2	...	1	1	3	4	1	1	2	3	4	23	633	54	463
Totals for 1906	1	3	1	2	1	3	...	...	1	...	...	1	13	325	22	303

ALVEOLAR PERIOSTITIS.

Veterinary Surgeon Paine reports as follows:

"I have been asked for advice with regard to a condition seen in these Districts in young horses, generally at the age of about three years, namely, enlargement of the facial bones, accompanied with retention of the temporary premolar teeth, and if neglected, with suppuration at the roots of the permanent premolars, followed in some cases with the abscesses bursting on the external surface of the bones.

"The condition has apparently been observed in this area for some years, and has been locally treated with reported success by knocking off the temporary teeth; but if the cases are not attended to in the early stages the animals never grow out properly, and are quite useless. Since this condition apparently only occurs in our forage districts, where young horses are allowed to eat bearded forage, such as wheat chaff, I am inclined to believe that the sole cause is the penetration of these barbs into the tender gums of the young animal, and that they afterwards work their way up between the teeth, and so set up inflammation of the Alveolar Periosteum. I am not inclined to connect it in any way with Bone disease (*Osteoporosis*); and have tried to impress upon the owners the necessity of feeding their young stock upon a more suitable diet."

EPHEMERAL FEVER OR THREE DAYS' SICKNESS.

This disease has been widespread during the last two months of the year. In 1906 this disease appeared in Rhodesia, and early in 1907 a few cases occurred in Bechuanaland and Griqualand West. The symptoms of this disease are:—

Symptoms.—The earliest indications of attack are an elevation of temperature, with slightly increased salivation and roughened appearance of the coat. In a few hours these symptoms become aggravated, the temperature may run up to over 107° F., salivation is more pronounced, the mucous membrane of the mouth becomes reddened and the eyes injected, breathing and pulse are hurried, rumination is suspended, the affected animal ceases to feed and occasionally grinds its teeth, the bowels may be relaxed or slightly constipated, there is extreme muscular stiffness with great disinclination to move and apparent lameness, the animal standing with its back arched, and moving with difficulty. Occasionally an affected animal lies down, and is either unable or unwilling to rise. With development of these symptoms the temperature appears to subside rapidly. In about forty-eight hours the appetite returns, the symptoms gradually disappear, and the animal soon becomes convalescent, so that the term "Three Day Sickness" is somewhat appropriate.

Mortality.—The mortality from this disease appears to be small. In Rhodesia not more than one or two *per centum* of deaths were reported, while in this Colony and in the Transvaal, so far, none have been recorded.

Treatment.—The administration of a dose of laxative medicine, preferably Epsom Salts, appears to be all that is necessary, but it is almost preferable to leave them alone.

Manner of Spread.—Up to the present nothing is known of the manner in which this disease is spread.

Veterinary Surgeons Hutchence and Simson report:—

Veterinary Surgeon Hutchence:—

"This disease has been much more severe up here than you state it to be in the Colony. We have lost 5 to 7 per cent., I think mostly owing to the very changeable weather. One day is tropically hot and the next like the middle of winter.

"We had a very cold rain about a week ago that killed a great number. They were mostly recovering, but when the cold came they died of Acute Pneumonia. A few have died from Gall-sickness, probably secondary to the high fever of the original disease."

Veterinary Surgeon Simson:—

"This disease appeared among cattle from February to middle of May. Briefly the symptoms were high fever, frequently, but not always, accompanied by lameness in one or more limbs, with disinclination to move. Worst cases were paralysed, some to the extent of lying flat on side, with fœtid smell in mouth. Several passed blood and mucous on fæces, but probably former was due to being rather constipated. Mortality was very low, as I never saw any fatal cases.

"Recovery, even in severe cases, was very rapid. In one instance a bullock lying flat on side, unable to rise or lift head, with high fever, was found grazing with herd about three miles away 24 hours later.

"Majority of cases received no treatment by owners, but probably a laxative drench is beneficial, as I administered same in severe cases. Worst cases, when unable to rise, are not unlike Lamziekte, but the several cases of Lamziekte that I examined they showed 'sub-normal temperature a slow pulse.'"

LAMZIEKTE.

During the year Mr. Spreull energetically continued the experimental work at Koopmansfontein, his report on which will appear in full in the *Agricultural Journal*, the following being a summary of the experiments and results: The necessity for and the good results obtained by the free use of bone-meal will, I trust, be taken seriously to heart by the farmers living in those Districts where the disease prevails.

Between 17th and 24th October, 1906, 98 head of cattle arrived from eleven different farms in the Kimberley District for the different feeding experiments (one ox died soon after his arrival), leaving only 97, which were divided into different lots as follows:—

(1) 17 Cattle (Controls) received a salt lick only.
(2) 20 Cattle (Find Themselves Lot) were allowed access to as much bone-meal and salt (mixed in equal proportions) as they cared to lick.
(3) 20 Cattle (Extra Bone-meal Lot), besides having access to lick, were dosed with three tablespoonsful of fine bone-meal three times a week.
(4) 20 Cattle (Tar and Bone-meal Lot) dosed with two tablespoonsful Stockholm tar three times a week, also receiving three tablespoonsful of bone-meal at each dosing.
(5) 20 Cattle (Loog-ash and Bone-meal Lot) were dosed with two tablespoonsful of loog-ash three times a week, also receiving three tablespoonsful of bone-meal at each dosing.
(6) A further lot of ten head (Tar Alone Lot) were received on February 19th, and were dosed with three tablespoonsful of Stockholm tar twice a week.

Results.

(1) *Controls.*—Of this lot six died from Lamziekte, one of which died very early in the experiment. Four others at various times became sick from Lamziekte, one having two attacks, and two are still sick.
(2) *Find Themselves Lot*, as their name implies, received no dosing. Two died of Lamziekte in December, 1906, at a time when it could with good reason be maintained that their economy had not absorbed enough of the bone-meal preventive. Since then only one other animal sickened, but not from Lamziekte, the disease being Ephemeral Fever.
(3) *Extra Bone-meal Lot.*—Of this lot not a single case of Lamziekte or any other sickness occurred.
(4) *Tar and Bone-meal.*—One animal died from Lamziekte, on December 7th, 1906, after receiving only one dose of tar, and one died from acute Gastro-enteritis (unknown origin).
(5) *Loog-ash and Bone-meal.*—One case of Lamziekte took place on 24th December, 1907, this being the only bone-fed animal which died of the disease after receiving sufficient bone-meal to act as a preventive. Recently there was a mild case in this lot, and one cow died from Suppurative Pneumonia.
(6) *Tar Alone Lot.*—One died from acute Lamziekte in January, 1908, and at present there are two mild cases in this lot.

SWINE FEVER.

It is gratifying to report that this disease has been stamped out, not a single case having occurred during the past year.

This disease is at present costing Great Britain an expenditure of some £50,000 per annum.

EAST AFRICAN COAST FEVER.

This Colony still remains free from this disease, but as the disease is rapidly approaching our Cape-Natal border, we are in imminent danger. Stringent measures have been adopted to guard the border of the Transvaal and Natal, and the erection of the fence between Alfred County, in Natal, and Pondoland is being pushed on with all possible speed.

J. D. BORTHWICK,
Chief Veterinary Surgeon.

APPENDIX II.

REPORT OF THE DIRECTOR OF THE VETERINARY LABORATORY, GRAHAMSTOWN, FOR THE YEAR 1907.

In submitting my Report for 1907 I must take this opportunity of impressing upon the Government the urgent necessity of starting some organised scheme for the thorough investigation and elucidation of some of the more important of our Stock Pests. It has been said, and with a fair leaven of truth, that this Colony is cursed with all the stock diseases of Europe and a few special ones of her own. At present we are—with the exception of a feeding experiment on Lamziekte at Koopmansfontein and some scratch work here—doing nothing to elucidate their cause, nature, modes of spread or prevention. To one who does not know this Eastern District, I am positive that statistics as to the number of stock lost every year would appear as incredible. I can show ten farmers who during the past year have lost birds and chicks to the value of £5,000 between them, and the losses in some areas from cattle diseases must run into many thousands yearly. This question of animal diseases is assuming great importance, and will assume greater when the stock increase in number and value. We are getting finer birds, better cattle, and higher grade sheep in the Colony every year, but a reaction will set in when importers see their losses, and we cannot expect breeders to grade up their flocks and herds when they are at the mercy of many dreaded and, worse than that, unknown diseases, whose nature, cause, and mode of spread are unknown, and therefore unguardable against. Taking this District as an example (I know it pretty well), ostriches (the feathers of which the Colony exports to the value of a million and a half pounds sterling per annum) have diseases of all kinds rampant amongst them, and we are doing nothing to ascertain their nature, cause, or any preventive measures to arrest their spread. As an example, no one knows how the Wire-worm and the Tape-worm of the ostrich gets entrance into the bird's body or where it comes from, and therefore cannot institute preventive measures by destroying the vehicle in the first parasite, or its host in the case of the second. In some parts of this Coast District cattle cannot be kept, though the veld is all that could be desired, and I am sure that the loss from one disease (Pasteurella?) in these three Districts must be many thousands a season. Surely we should endeavour to remedy this state of things, and foster especially our only monopoly, the export of ostrich feathers. I will not mention the efforts of the Transvaal in that direction; they are spending in a regal manner, and as a result they are now in possession of a vaccine protecting mules against Horsesickness, and this past year for the first time in history men could trek with mules, without loss, at any season of the year through such Districts as Nel's Rust and the Swaziland borders; and what has been done with that disease can be accomplished with others. The work of Veterinarians in the past has resulted in protective inoculation for such pests as Rinderpest, Anthrax, Lungsickness, Black Quarter, and Redwater, and I am confident that it only requires thorough investigation to put us in possession of facts to enable us to cope with many more. Even at the risk of being termed impractical, I would urge the Department to draw up some scheme for the continued, thorough, and systematic working out of some of the Stock Diseases of this Province. It will cost a large sum, but it will be money well invested, and in these depressed times I think that the need to look after all our assets is a bounden duty, and I trust the Minister will see his way to move in the matter.

In regard to the question of reduction of expenditure, there is such a thing as retrenchment pressed too far, and I must protest against this policy when carried out to such an extent as to render a station such as this incapable of doing the full amount of good it should. I trust I may be pardoned for the remark that it is hardly wise to retrench over the investigation into the diseases of our stock, and I do hope the Minister will give this matter his attention. It does seem such a pity and loss to see stock dying from diseases which we recognise as incurable, and of which we know nothing further.

The question of an experiment on a large scale with the disease "Lamziekte" in this District is one which I have written much about, and I trust it will receive consideration when schemes for the advancement of this Colony's Stock Industry are under consideration.

Black-Quarter Vaccine (Sponsziekte).—Doses issued: Powder, 5,107; single cord, 2,100 (Blacklegine); double cord, 210 (Blacklegine).

Anthrax (Miltziekte).—Tubes issued: 77=1,925 doses.

Mallein.—Doses issued: 17,545.

It is unnecessary to make any comment upon this diagnostic agent, its worth being universally recognised.

Malarial Fever in Sheep (Bluetongue).—Doses sent out: 8,650.

The preparation of this vaccine has been discontinued, as it is now obtained from Pretoria; the conditions there render it capable of being produced much more cheaply than we can do so at Grahamstown.

Nitro Bacteria Culture.—This material for several of the more important Legumes has been prepared and issued from this Laboratory. I am not in a position to speak of its practical value; the reports on its use are forwarded to Dr. E. Nobbs, Agricultural Assistant.

Specimens Received and Examined.—During the past year 131 specimens have been received at this Laboratory for diagnosis; they vary much in character, from blood smears, bottles of water, to milk, and bodies of horses, calves, ostriches, sheep, etc.

Cases Examined at Clinique.—At this Laboratory we conduct a Clinique, where owners of sick animals can have them treated, and, if necessary, operated upon. During the past year 431 animals have passed through the Clinique, and a considerable number have been visited at their owners' residences. The cases were those met with in general practice, and of no particular interest.

Lectures.—I have delivered a course of eight lectures and given three practical demonstrations before the Students attending the Vacation Course at Rhodes University, and delivered one lecture on the Nitrifying Bacterial in relation to the growing of Lucerne, before the Lower Albany Farmers' Association, and another on Lamziekte before the same body.

	1907. Doses.	1906. Doses.	1907. Value. £	s.	d.	1906. Value. £	s.	d.
Lungsick Virus	192,603	15,415	2,407	10	9	192	13	9
Redwater Virus	5,577	912	204	8	0	26	11	0
Bluetongue Serum	8,650	3,300	65	4	2	33	0	0
Mallein	17,545	11,100	292	8	4	185	0	0
Black-Quarter	7,417	2,540	246	6	2	74	10	0
	Tubes.	Tubes.						
Anthrax	77	35	38	10	0	17	10	0
			3,254	7	5	529	4	9

Value of Stock in Veterinary Laboratory, Grahamstown.

	£	s.	d.
Cattle:—			
Oxen	200	0	0
Cows	100	0	0
Calves...	60	0	0
Horses, carts, harness, etc.	150	0	0
Vaccines, etc., in stock	50	0	0
	£560	0	0

Redwater Inoculation Preventive.—At present the only way by which we can be certain that an Immune animal's blood is safe for preventive Inoculation purposes is by actual inoculation test; the microscope fails to reveal any special phase of the Parasite's life history which can assist us, and even the numerical presence of the Piroplasma has little bearing on the matter. The cattle are bled and their blood tested, and thus in a practical manner freedom from any risk or accident is assured. At intervals the animals of the bleeding herd are inoculated with doses of virulent Redwater Blood, and tested on clean cattle previous to the issue of the Redwater Vaccine at next bleeding.

This inoculation, where properly carried out, has been an unqualified success, and the users of the Vaccine bear me out in my opinion. In three prominent instances the disease has been kept in check and stamped out when the herd was badly affected before inoculation. This past year has been a most prolific one for ticks; observers and farmers assure me that the cattle show more of these pests this year than any other they remember. This is noticeably the case of R. Decoloratus, the Blue Tick, and in their train has come Redwater (P. Bovis); this disease is extending from the Fish River, and to my knowledge five farms have shown the disease this season for the first time, and all in this immediate neighbourhood. In all cases the owners have inoculated, and in all cases with success. Demands for this Vaccine are constant and on the increase, and I foresee a very large demand next year, when, I am informed, Inoculation in this District will be on a wholesale scale. While strongly advocating the inoculation of cattle in an area where the disease is known to exist, I strongly disapprove of a cattle owner inoculating his cattle in a clean area "to protect himself." It must be borne in mind that inoculated cattle can convey the disease and an inoculated herd a practical centre of Redwater. In a clean area I would rather favour the arrest of its spread by Quarantine, Fencing, and Dipping, than by Inoculation, while in a Redwater area I think the sooner the cattle there are inoculated the better. While alluding to Dipping for Ticks, I would like to point out that the progeny born of Salted (Immune) parents on Redwater veld are not born immune, but acquire immunity through the attacks of infected Ticks. If Dipping is rigorously carried out these pests will diminish, and the owner of a Salted herd will do well under such conditions to inoculate his rising stock every generation. I consider that even on a badly infected Redwater veld a very small percentage of Ticks are affected with the Piroplasma and in a position to carry the disease; this is noticed in cows kept in this town and run on the commonage. Sometimes it takes an uninoculated animal two years to contract the disease, though its hide may be hidden under the number of R. Decoloratus Ticks.

Cape Cows: Rendering same Immune.—Most would-be purchasers of such stock are somewhat debarred from doing so by the severe mortality which prevails amongst such animals when grazed on this Eastern Province veld, the majority of deaths being due to Redwater. It is also noticed that such animals do not similarly re-act to the inoculation, one cow passing through the inoculation well, another inoculated with similar material dying from the disease in an acute form. I am of opinion, from the result of experiment, that much better results will be obtained if such class of stock be kept under cover and free from ticks during the period of re-action, and it was with a view of obtaining some further data on the subject that I obtained four good Cape Cows from the Western Province. These animals passed through the inoculation successfully, and gave us the necessary standard at which to issue our vaccine for such animals.

Redwater Vaccine sent out	3,817 doses.
Number of Cattle inoculated	1,760
Total	5,577 doses.

WILLIAM ROBERTSON,
Director.

APPENDIX III.

REPORT OF THE CHIEF INSPECTOR OF SHEEP FOR THE YEAR 1907.

I have the honour herewith to submit my report on the working of the Scab Acts of 1894 and 1899, as well as of Proclamation No. 60 of 1903, for the year ending 31st December last. A comparison of the returns now supplied by the Sheep Inspectors throughout the Colony, with those forwarded at the close of 1906, shows a very slight reduction in the percentage of infected sheep, but I regret to state that the progress, however slight it may be, has not been continuous, for during the winter months outbreaks of Scab occurred in many Districts, occasioning a great deal of additional work and anxiety for the local Sheep Inspectors, at a time of the year when it is always most difficult to persuade owners of stock to adopt treatment, which, although it may be considered by some to be severe, proves in the end the most economical.

At the close of 1906 the percentage of infected sheep in the Colony proper amounted to 2·88 per cent., but on the 30th June last this had increased to 6·35 per cent., and the only Divisions which on that date were quite free from Scab were East London and Port Elizabeth. Outbreaks of this nature are most discouraging, but are bound to occur with greater or less severity, until the movement of infected stock can be restricted and power given to Sheep Inspectors to deal in an effectual manner with infected premises, such as kraals, sheds, and sleeping places. My assistants, as well as the majority of the Sheep Inspectors, attribute the increase of Scab during the winter, as well as its prevalence at the present time, to the above-mentioned causes, but many add in their reports that careless dipping and the use of dipping ingredients which do not act as preventives to re-infection, are responsible for the existence of the disease in many parts of the country. I have no doubt in my own mind that the explanations given by my staff are correct, for outbreaks of Scab caused by the removal of infected stock have of late assumed alarming proportions, and figures which I think will prove my point will be given at a later stage in my report. As regards the assertion that the re-infection of sheep and goats is due to the use of old premises, in, or on, which infected sheep have been kept, I feel convinced that many of the recent outbreaks may be attributed to this cause. During the past winter, owing to the wet and cold weather, stock were confined when lambing in old kraals, etc., and experiments which have been completed during the year show that such kraals when abandoned can retain the germs of infection for six and twelve months, and possibly longer. This matter, however, will also be dealt with later in my report.

On the 31st December last nine Divisions, containing 1,073,825 sheep and goats, were reported by the Inspectors to be quite free from Scab. For the corresponding period in 1906, there were eleven Divisions, containing 1,147,181 sheep and goats, declared to be clean. In six of the last-mentioned Divisions—Barkly West, Humansdorp, Kimberley, Komgha, Port Elizabeth, and Victoria East—there are at the present time a few infected flocks. In Barkly West two areas are still clean, but in the third the Inspector reports 9 infected flocks. In Humansdorp there are 14 flocks totalling 606 goats, which, it appears, have contracted the disease from infected stock introduced into the Division and scabby pigs running in the locations. In Kimberley there are three infected. In Komgha two infected flocks, numbering 1,800 sheep, have lately been introduced into the Division, and although the Scab has been cured, the flocks in question had not on 31st December last been released from quarantine. In Port Elizabeth two infected flocks were reported by the Inspector, and in Victoria East 140 sheep and goats were still under order to cleanse when the yearly report was forwarded to this office. At the close of the year the Divisions which were reported to be free from Scab were the following:—Alexandria, East London, George, Herbert, Knysna, Namaqualand, Paarl, Stellenbosch, and Stutterheim.

The percentage of infected stock in the Colony (omitting Bechuanaland and the Native Territories) at the close of the years 1903, 1904, 1905, 1906, and 1907 is shown in the following comparative tabular statement:—

YEAR.	Free from Scab.		Under 1% of Scab.		1% and under 3% Scab.		3% and under 5% Scab.		5% Scab and over.		Percentage of Infected Stock on 31st December.
	Number of Divisions.	Number of Stock.	Number of Divisions.	Number of Stock.	Number of Divisions.	Number of Stock.	Number of Divisions.	Number of Stock.	Number of Divisions.	Number of Stock.	
1903	4	122.780	6	984,121	9	2,330,172	5	1,103,161	51	10,133,373	12·73%
1904	7	263,464	6	1,018,398	21	4,612,219	11	2,437,049	30	7,735,702	5·55%
*1905	10	904.189	18	4,402,760	12	3,344,645	8	1.977,262	23	5,500,500	4·84%
†1906	11	1,147.181	20	5,689,837	23	6,496,793	9	1.767,036	11	3,415,942	2·88%
‡1907	9	1,073,825	18	4,916.584	29	9,850.213	7	1,951.523	12	3,956.617	2·54%

* 4 Divisions omitted. † 1 Division omitted. ‡ 1 Division omitted and Laingsburg added.

What may be termed the Black List (which includes those Divisions which contain 5 per cent. of Scab and over) comprised on the 31st December, 1906, the following:—Aliwal North, Beaufort West, Calvinia, Carnarvon, Clanwilliam, Colesberg, Hope Town, Molteno, Swellendam, Uitenhage, and Victoria West, the average percentage of Scab amounting to 9·16 per cent. On the 31st December last Beaufort West, Calvinia, Colesberg, Swellendam, and Victoria West were still on the list, but to these had been added the Divisions of Aberdeen, Britstown, Fraserburg, Mossel Bay, Port Elizabeth, Robertson, and Sutherland.

Although there has been an increase in the number of the Divisions and stock contained therein, in which 5 per cent. of Scab and over exists, the average percentage of infection in these parts has been reduced during the year by over 2 per cent.

Although the returns for the year do not show the decrease of Scab that I could have wished, the fact must not be lost sight of that the administration of the Scab Acts has been, and still is, severely handicapped by the continuous removal of stock for speculation and slaughter purposes, as well as for change of pasture in times of drought. This is a factor which retards the work of cleansing stock in no small degree, and at the same time it is one which is extremely difficult to deal with under our present laws. Speculators can purchase infected sheep for slaughter in the Divisions of Kenhardt, Prieska, Namaqualand, Calvinia, or any part of the country, and after the stock in question have been dipped once under the supervision of an Inspector (an operation which only suppresses the disease for a few days), may move the same under the provisions of Section 37 of Act No. 20 of 1894 to any part of the country. These sheep may be driven for weeks until the market is reached, and the Inspectors through whose areas the stock are moved are powerless to take action in the matter. The terms of the above-mentioned Section tend in no small measure to spread Scab, but, after all, the harm done cannot be compared to the damage which results from the abuse of the very liberal provisions of Section 26 of the same Act, which permits the owner to issue his own pass for the removal of sheep. Some idea of how infection is spread by these removals may be gathered by a perusal of the following figures obtained from the Sheep Inspectors:—

During the past twelve months nine infected flocks were introduced into the Division of Cathcart, and eight of these were removed by the owners under their own passes, issued under Section 26 of Act No. 20 of 1894. Ninety-one infected flocks were removed into the Division of Oudtshoorn, and seventy-six of these introduced under owners' passes. Komgha, a clean Division, suffered by having eight infected flocks brought in during the year, one of these being with the owner's pass. In the Division of Humansdorp nine infected flocks were introduced, all being moved with passes granted by the owners. Two flocks infected with Scab were brought into the Division of Stutterheim, one of these being with an owner's pass. Beaufort West and Victoria West, however, have suffered severely in this respect, for these Divisions appear to be the dumping-ground for most of the infected stock moved from the more Northern Divisions. In the first-named Division two of the four Inspectors report the introduction of fifty-six infected flocks during the year, and of this number forty-six were brought in with owners' passes. In Victoria West two of the Inspectors report the introduction of forty flocks infected with Scab, and twenty-two of these were removed under passes issued by the owners. Queenstown was also punished to the extent of eleven infected flocks, most of which were introduced with passes issued by the owners. Port Elizabeth suffered by having eleven scabby flocks introduced, and in seven of these cases the stock were brought in with owners' passes. The Inspector of the Bedford Division reports one infected flock introduced into his area with an owner's permit, but he adds that in no less than thirty-two instances outbreaks of Scab occurred among flocks which were brought into the Division apparently clean, but which developed Scab within two months of their introduction. I do not wish to infer that in all these cases Scab must have been apparent in the flock when the permit was issued by the owner, but the figures, in my opinion, tend to prove that many flocks which appear to be free from Scab have in reality never been thoroughly cleansed, and that the dipping carried out has merely had the effect of suppressing the disease for a short time. I have no doubt also that Scab is frequently contracted owing to the stock sleeping in infected kraals whilst being removed from one centre to another, and this should teach farmers a lesson, which many are slow to learn, that all sheep and goats brought to their farms from other parts should, although they may appear to be clean, be dipped as a precautionary measure before being mixed with any other clean stock.

The above figures show the seriousness of the situation, as well as the hopelessness of ever keeping any part of the country clean for any considerable time. Until our laws are amended to meet the danger mentioned, clean flocks, areas or Districts can never be considered as thoroughly safe.

In my last annual report I alluded to the fact that experiments were being carried out with a view to ascertaining for what period kraals in which infected sheep or goats had been kept could remain a source of danger to clean sheep. Two of these tests have now been completed, with the following results:—

The first experiment was conducted on the farm Karreepoortje, in the Division of Jansenville, where an old kraal, in which Angora goats had been kept for many years, was enclosed with wire netting and barbed wire, and divided into five sections on the 11th August, 1906.

It appears that in January, 1906, a flock of Angora goats, free from Scab, was placed in this kraal, and contracted the disease about two months later. The goats were removed to another part of the farm and the kraal abandoned, so that at date of enclosure it had not been used for four or five months. On the 23rd March, 1907, a flock of Angora goats grazing on the farm and numbering slightly over six hundred was examined, and found to be quite free from Scab. One hundred of the goats were selected, branded with a distinctive mark, and allowed to sleep in the western section of the kraal. The surface of the manure, which averaged some two feet, was turned over two or three times whilst the goats occupied the kraal. On the 13th May, 1907, or just about nine months after the kraal was enclosed, it was reported that one of the goats showed signs of Scab. The existence of the disease was confirmed by the local Inspector, who found three Scab insects on the animal in question. On the 15th June the 100 goats were taken from the kraal, when four animals were found to be suffering from the disease. The remainder of the flock, numbering 502, which had been kept for control purposes, remained perfectly clean, and up to the 26th July, when my last reports were received, were still in that state. It thus appears that the kraal, which had not been in use since March, 1906, must have retained infection for a period of twelve months; or, to be more precise, and taking the date on which the fencing round the kraals was completed as the 11th August, 1906, seven months elapsed before any stock was placed in the kraal, and nine months expired before any signs of Scab appeared on the goats kept in the said kraal. During the experiment the one hundred goats were kept entirely separate from any other stock, and slept every night in the kraal. The remaining four sections of the enclosure are being kept for experimental purposes at a later date. In the second test the experiment was carried out on the farm Swart Rivier, in the Division of Caledon. On the 27th September, 1906, I visited this place and examined a kraal, reported by the owner, Mr. P. Swart (to whom my best thanks are due for all the assistance he rendered in the test) to be a sure source of infection. The kraal, which measured 105 by 45 feet, was enclosed with wire plaited with Rhenoster bush, and had an average depth of dung of four inches. On the 25th October, 1906, a flock of eight hundred sheep which slept in the kraal was examined, and quite 7 per cent. of the animals were found to be in an infected state. These sheep were dipped and cleansed and sent to another part of the farm. The kraal was closed on the 16th November, 1906, and on the 17th May following, after it had remained vacant for six months, a flock, numbering 486 sheep and goats, which were perfectly clean, was allowed to sleep in it every night, the dung in the kraal being turned over several times whilst it was occupied. On the 29th June, 1907, the sheep were examined by my Assistant, Mr. W. J. Smuts, and the local Inspector, when eleven animals were found to be suffering from Scab, the spots varying in size from a threepenny to a shilling piece.

It appears, however, that the herd who looked after the flock noticed Scab on the 19th June, which shows that 33 days elapsed before visible infection actually took place. Although the kraal had been closed for six months, it still retained the germs of infection. In connection with these tests, Assistant W. J. v. d. Merwe, of Graaff-Reinet, reports that he arranged with Mr. C. J. van Heerden, of the farm Ruigte-vlei, in the Division of Murraysburg, to experiment with a certain kraal in which infected sheep had been kept. This kraal was closed for about twelve months, and on the 28th May last 110 Cape sheep, which were quite free from Scab, were allowed to sleep in the kraal, with the result that within three weeks Scab appeared, and when my Assistant examined the flock on the 4th July, nearly every animal was badly infected. All the rest of the stock on the farm Ruigte-vlei, including that portion of the flock from which the 110 Capes had been taken, remained clean. On the 25th June Mr. Van Heerden addressed my Assistant in the following terms:— "I am thoroughly convinced now that it is ridiculous to try and eradicate Scab so "long as a farmer continues to use his old infected kraals."

The results attained by these experiments should, I consider, cause farmers to exercise the greatest care when cleansing their sheep (which is a comparatively easy matter), to deal in an effective and thorough manner with regard to all infected premises on their farms. At the present time the Sheep Inspectors have certain powers under the Scab Acts which enable them to cleanse infected stock. The position, however, is anomalous, for the kraals, etc., which constitute one of the main sources of re-infection, are sacred ground, and cannot be treated without the consent of the owner. To cleanse scabby stock and then replace them in the old kraals, without taking drastic measures to disinfect the same, is simply to court a repetition of the trouble, and places the Inspector in the invidious position of knowing that only half of his task has been accomplished, and that sooner or later he will have to repeat the operation of dipping at great loss of time and labour. If the officers appointed under the Scab Acts are expected to cleanse infected stock, full power should have been granted them to do the work in a thorough manner, for half measures are always in the end least satisfactory, and at the same time the most expensive. The principle of thoroughly cleansing or disinfecting premises is admitted and provided for in Section 18 of Act 20 of 1894, but this only took effect during the period allowed for simultaneous dipping, and has now lapsed. Until the law provides for the effective treatment of premises, or farmers adopt the same opinion as expressed by Mr. Van Heerden, which has already been quoted, there is but little hope of ever entirely eradicating Scab in the country.

In connection with an experiment, which was carried out at the Quarantine Station, Maitland, in order to test a certain sheep dip, some interesting information was gained, when the sheep experimented with were being infected with Scab. About the commencement of June last thirty-one clean sheep were brought from the Bedford Division and placed in the Quarantine Station. On the 6th June eleven of the sheep were selected, marked with red paint and three Scab insects placed on each animal. On the 8th idem fifteen more sheep, marked with blue paint, were treated in a similar manner. On the 12th June my Assistant, Mr. W. J. Smuts, who carried out the work of infection, examined the animals, and found that on four of the sheep marked with red paint (which were infected on 6th June), and on two animals marked with blue paint (infected two days later), the infection had produced visible results, a redness of the skin and eruption of pimples being plainly noticeable. On the 14th June eight more sheep showed symptoms of Scab, making a total of fourteen which had become infected. On four of the sheep infected on the 6th June, and on one animal infected two days later, there was an increase, the young Scab insects being plainly visible. On this date (14th June) only three of the infected animals showed signs of irritation, and had it not been that the infected spots had been marked, the existence of the disease could not readily have been detected. On the 15th June four more animals showed an increase of Scab insects. On the 18th June the spots of Scab varied in size from a shilling to a florin piece. On the 3rd July one of the infected sheep, which had a spot of Scab as large as a half-crown piece, showed no signs of irritation, and it required careful handling to discover the infected place, there being absolutely no sign of biting, rubbing or scratching. On the 24th July, the infected spots varied in size from three inches in diameter to twelve by four inches. The result of the experiment showed that on the fourth day after Scab mites were placed on a clean sheep signs of Scab were apparent, and on the sixth day young insects were visible, and, further, that a sheep may be suffering from Scab for nearly four weeks and yet show no outward sign of the disease.

The sheep experimented with were full-grown wethers in capital condition, every animal being fit for the butcher. The flock was not kraaled at night, being kept in an enclosure a little over an acre in extent, and fed on lucerne hay all the time.

During the first week of May last a Conference of all my Assistants in the Colony was held at Cradock, when the whole question of Scab legislation and the difficulties of administering the laws in certain parts of the country was thoroughly discussed.

I have no doubt that the meeting (which lasted for three days) was productive of good in more ways than one. The comparisons drawn respecting failures and successes were most helpful to all concerned, and I feel convinced that meetings of this nature cannot but prove of benefit to all partaking in them. Every section of the Scab Acts was thoroughly discussed in its relation to all parts of the country, and the result of the Conference was the framing of the outlines of an Act which it was considered would meet all difficulties and, if adopted, facilitate the eradication of Scab.

When future Parliaments undertake the amendment of the Scab Acts the resolutions passed by my Assistants should be of some value, as representing the views of men, many of whom have spent the best years of their lives in the work of Scab eradication.

The contravention of the Scab Acts reported during the twelve months total 1,111, the convictions 965, and the penalties imposed amount to over £2,788, or an average fine of nearly two pounds eighteen shillings—the figures for the preceding year being 850 prosecutions, 723 convictions, and an average penalty of nearly two pounds fifteen shillings. An analysis of the prosecutions for the past year show that there were 672 convictions for contraventions of Section 21 of Act No. 20 of 1894—for failure to report outbreaks of Scab or neglecting to make proper and diligent efforts to cleanse the sheep, and 221 owners were fined for removing infected stock, the balance of the prosecutions being for obstructing the Inspectors in the performance of their duties, failure to construct and provide dipping-tanks, and removing sheep without a proper pass.

The number of sheep and goats in the Colony has increased during the past year by nearly three and one-quarter millions. Woolled sheep show an increase of over one million, cross-breds (including Cape sheep) of one and one-quarter millions. Angora goats have increased by over four hundred thousand, and common goats by over half a million. The lambs and kids reared amount to eight hundred and forty thousand more than in 1906, but the losses from disease and drought exceed those of the previous year by over ninety thousand.

As regards dipping-tanks, considerable progress has been made during the year, seven hundred and thirty-nine tanks having been constructed, which brings the total number of dipping tanks in the Colony to nine thousand four hundred and sixty-one. Of this number, seven hundred and fifty-three are constructed of iron, and the remainder of brick, stone and concrete.

In Bechuanaland the work of Scab eradication has been greatly hampered by the small number of officers appointed to administer the Scab Acts. In the Divisions of Gordonia and Vryburg large tracts of country have yet to be visited, and it is quite impossible for the Inspectors of these areas to examine even those flocks which they have placed under cleansing orders when the period allowed for that purpose expires. I have merely to mention the fact that Gordonia, Taungs, and Vryburg comprise a tract of country of over forty-eight thousand square miles, and that we have only three Inspectors in the whole of that area, to show how futile the efforts of these men must be. The figures contained in the returns for the Divisions mentioned give a very poor idea of the stock they contain.

Although little or no progress has been made towards the eradication of Scab in Bechuanaland, in one respect at least an improvement has been effected, and that is as regards the construction of dipping tanks. At the present time my returns show that there are 144 tanks in Bechuanaland, and that 52 of these have been built during the past twelve months.

On the 31st December, 1906, the percentage of Scab was reported as 1·66 per cent., and at the close of the year this had increased to 4·15 per cent., mainly owing to a large excess of infected flocks in the District of Mafeking, for which part a new Inspector has recently been appointed.

In the Transkeian Territories considerable progress has been made in some parts, whilst in others again a great deal of trouble has been experienced, mainly owing to the carelessness of certain Sheep Inspectors. At the close of the year the following twelve Districts were declared by the Inspectors to be free from Scab:—Butterworth, Elliotdale, Flagstaff, Idutywa, Lusikisiki, Matatiele, Mount Ayliff, Ngqeleni, St. John's, Tabankulu, Tsomo, and Willowvale, containing in all 967,611 sheep and goats. At the close of 1906 eight Districts, including 806,883 sheep and goats, were returned as clean. The most trouble has been experienced in the Districts of Mqanduli, Umtata, and part of Engcobo, in which areas the percentage of Scab on the 31st December last amounted to no less than 8·15 per cent.

In Tembuland and the Transkei, in which area there are nearly one and three-quarter million sheep and goats, the percentage of Scab on the 31st December last amounted to 3·52 per cent, and at the close of 1906 to 2·90 per cent. In Griqualand East, for the same periods, the percentages were 1·00 and 0·25 per cent.

In Pondoland at the close of the year the percentage was 0·11 per cent., as compared with 1·50 per cent. for 1906.

During the past twelve months 63 dipping tanks have been constructed, which brings the total number of tanks in the Territories to 1,034. Of this number 891 are constructed of stone or brick and the remainder of iron.

The increase of lambs and kids has on the whole been poor, amounting to 764,238, as compared with 615,871 in the previous year. The losses totalled 375,228, or some 17,000 less than the year before.

The prosecutions for contravention of Proclamation 60 of 1903 during the twelve months totalled 1,008, the convictions 875, and the penalties amounted to £986 3s., or an average of a little over 22s. 6d. The figures for the preceding year being 882 prosecutions, 790 convictions, and an average fine of slightly over 21s.

During the removal of sheep from Barkly East in the spring of the year, 123 flocks, totalling 58,649 sheep and goats, were introduced into the District of Elliot, and 326 flocks, containing 190.293 sheep and goats, into Griqualand East. Among these, 28 flocks, including 14,776 sheep, were found to be slightly infected with

RETURN of Small Stock in the Several Districts of Cape Colony on 31st December, 1907.

DIVISION. Territorial and Fiscal.	Total No. of Flocks.	Total Number of Sheep and Goats.				Total.	Free from Scab.		Under Order to Cleanse.		Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.			Flocks.	Sheep and Goats.	Flocks.	Sheep and Goats.		
		Woolled.	Cross Bred.	Angora.	Others.							
SUMMARY.												
1. Colony Proper	60,607	8,482,212	6,083,752	3,366,090	3,816,708	21,748,762	59,667	21,196,050	940	552,712	6,202,197	722,402
2. Bechuanaland	3,587	83,830	294,295	60,674	307,762	746,561	3,298	715,566	289	30,995	168,386	12,105
3. Transkei...	11,812	479,304	...	...	245,087	724,391	11,781	722,176	31	2,215	153,938	102,784
4. Tembuland	12,756	673,191	4,089	33,537	273,658	984,475	12,286	926,418	470	58,057	256,178	150,484
5. Griqualand East	12,667	842,361	7,603	68,376	279,330	1,197,670	12,640	1,185,778	27	11,892	270,026	60,925
6. Pondoland (East and West) ...	13,991	191,521	527	...	241,974	435,022	13,983	434,542	8	480	84,096	61,035
Grand Total	115,420	10,753,419	6,390,266	3,528,677	5,164,519	25,836,881	113,655	25,180,530	1,765	656,351	7,134,821	1,109,735
DETAIL.												
1. COLONY PROPER.												
Aberdeen	829	23,810	102,092	286,683	13,896	426,483	787	401,793	42	24,690	112,804	38,977
Albany	792	55,047	81,615	900	40,209	177,771	769	173,430	23	7,341	50,942	12,299
Albert	1,015	487,765	81,898	29,498	7,610	606,771	1,006	598,614	9	8,157	159,176	4,760
Alexandria	245	1,600	18,507	...	11,908	32,015	245	32,015	...	...	7,500	920
Aliwal North	731	383,697	50,226	24,620	2,567	461,110	719	455,377	12	5,733	122,718	8,000
Barkly East	959	662,784	14,476	10,715	2,906	690,881	948	681,411	11	9,470	194,634	33,134
Barkly West	1,348	70,508	68,325	20,348	157,053	316,234	1,339	313,134	9	3,100	118,322	64,353
Bathurst	399	232	6,434	...	11,571	18,237	393	17,976	6	261	6,076	3,670
Beaufort West	721	139,822	220,298	99,415	92,675	552,210	678	516,600	43	35,610	149,913	13,841
Bedford	839	196,954	90,642	91,625	22,438	401,659	832	396,806	7	4,853	81,272	13,500
Bredasdorp	413	204,062	1,850	6,321	17,150	229,383	398	219,504	15	9,879	70,170	2,670
Britstown	571	104,376	210,972	23,907	57,504	396,759	538	368,311	33	28,448	90,961	1,539
Caledon	352	179,654	1,710	...	8,135	189,499	346	187,114	6	2,385	46,114	...
Calvinia	909	106,777	342,677	870	106,237	556,561	852	517,146	57	39,415	209,205	5,504
Cape	91	21,767	933	...	2,807	25,507	88	24,414	3	1,093	3,809	60
Carnarvon	1,081	56,954	490,376	17,294	136,597	701,221	1,063	686,681	18	14,540	246,240	26,297
Cathcart	663	333,287	4,938	22,564	4,773	365,562	660	363,781	3	1,781	62 977	20,711
Ceres	314	103,922	37,621	...	27,988	169,531	310	168,237	4	1,294	58,009	6,055
Clanwilliam	463	28,228	22,039	252	77,694	128,213	459	126,588	4	1,625	42,127	10,800
Colesberg	528	195,727	115,267	29,575	21,706	362,275	487	330,874	41	31,401	127,619	1,713
Cradock	1,584	179,886	268,746	308,517	19,775	776,924	1,557	759,060	27	17,864	185,458	35,835
East London	1,923	1,869	2,410	...	58,126	62,405	1,923	62,405	...	...	7,520	2,362
Fort Beaufort	623	103,433	40,350	20,645	27,232	191,660	620	191,081	3	579	41,624	6,974
Fraserburg	679	30,848	387,134	2,369	81,116	501,467	648	474,176	31	27,291	151,355	1,652
George	249	43,885	4,851	1,568	20,953	71,257	249	71,257	...	...	10,525	1,424
Glen Grey	3,512	167,618	2,720	25,526	93,255	289,119	3,468	282,818	44	6,301	90,533	2,897

RETURN—(*continued*)—of Small Stock in the Several Districts of Cape Colony on 31st December, 1907.

District.	Total No. of Flocks.	Total Number of Sheep and Goats.				Total.	Free from Scab.		Under Order to Cleanse.		Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.			Flocks.	Sheep and Goats.	Flocks.	Sheep and Goats.		
		Woolled.	Cross Bred.	Angora.	Others.							
1. COLONY PROPER—Contd.												
Graaff-Reinet	661	140,524	104,091	174,909	41,034	460,558	638	446,169	23	14.389	133,558	19.716
Hanover	350	87.774	75,411	47.454	12,430	223,069	344	219,167	6	3.902	89.102	2,087
Hay	919	82,667	181.046	25,617	224,528	516,858	916	515,056	3	1,802	148,369	25.573
Herbert	762	46,372	122,495	14,410	112.734	296.011	762	296,011	...	...	139.655	13,202
Herschel	2.221	147.594	7,826	58,787	55.074	269.281	2.220	268,982	1	299	76,590	70
Hopetown	465	60.897	218,931	13.442	49,750	313,020	453	335,446	12	7,574	132.241	840
Humansdorp	537	67.383	17.467	2,483	21,729	109,062	523	108.456	14	606	33.800	7.500
Jansenville	1,403	4.510	68,608	506,655	95,998	675.771	1.369	657,587	34	18.184	149.148	17,471
Kenhardt	607	5,500	276,984	1.508	117,639	401,631	605	401.181	2	450	120,845	5.126
Kimberley	540	24.400	66,900	13,000	74,080	178,380	537	175,220	3	3.160	11.280	1,350
King William's Town	5,877	224.743	10,572	210	178,994	414,519	5,876	414,441	1	78	107,348	33,060
Knysna	102	14,434	1,356	171	3,613	19,574	102	19,574	...	...	6,800	2.100
Komgha	1,281	30,183	13,250	...	47,959	91,392	1,279	89,592	2	1,800	20,075	7.371
Ladismith	166	...	10,452	...	87,942	98,394	163	96.999	3	1,395	23,600	6,600
Laingsburg	223	18.442	71,052	75	48,618	138,187	220	136,462	3	1.725	41,687	1,360
Malmesbury	800	213.364	5,652	...	40,725	259,741	795	257,417	5	2,324	77,382	5,840
Middelburg	622	127,303	154,105	43,276	36,262	360,946	614	355,536	8	5.410	115.535	6,320
Molteno	388	120,482	16,728	14,623	1,016	152,849	384	149,489	4	3,360	46.838	4,297
Mossel Bay	362	77.739	242	133	22.615	100,729	347	95.635	15	5,094	10,860	1.684
Murraysburg	386	48,086	60,560	140,253	14,476	263,375	374	255,911	12	7.464	90,018	4,654
Namaqualand	1,025	230	164,338	...	117,985	282,553	1,025	282,553	...	...	118,775	21,105
Oudtshoorn	617	551	30,529	134	113,714	144.928	607	143,541	10	1,387	33,967	1.564
Paarl	166	29.802	3,361	...	8,860	42.023	166	42,023	...	...	10.150	690
Peddie	1 631	34,580	1,700	...	76,444	112,724	1,613	109,281	18	3.443	18,387	...
Philipstown	420	113.364	135,999	33,992	33.073	316.428	418	315.338	2	1,090	74,175	323
Piquetberg	523	115,480	5,755	...	62,031	183.266	518	181,098	5	2,168	49,355	2,882
Port Elizabeth	135	120	764	2	2,856	3,742	133	3.496	2	246	785	200
Prieska	532	43,271	269,428	12,866	97,290	422.855	521	411.945	11	10,910	158,537	15,244
Prince Albert	406	41,304	163.651	27,298	110.951	343,204	398	339.179	8	4,025	126,774	2,482
Queenstown	1,703	519,306	38,105	57.426	25,376	640,213	1,695	636,346	8	3,867	163,769	3,091
Richmond	460	138,478	57,301	47,955	24.202	267.936	447	257.648	13	10,288	90,946	2,432
Riversdale	857	177,659	4,025	1,530	109,406	292,620	854	291.225	3	1.395	66,729	7,720
Robertson	278	1,030	36,000	...	52,887	89.917	268	83,948	10	5,969	23,600	980
Somerset East	1,434	103,532	211,255	306,278	56,579	677.644	1,391	655.890	43	21,754	208.560	42.365
Stellenbosch	57	7,528	530	258	4,415	12,731	57	12,731	...	...	2.508	450
Steynsburg	579	145,385	77,113	21,781	10,236	254,515	568	249,025	11	5.490	84,624	5.820
Stockenstrom	673	70.640	14,115	10,820	21,734	117.309	669	116,496	4	813	29,090	14,378
Stutterheim	831	223,819	5.605	355	25,477	255.256	831	255,256	...	...	50,046	7.794

RETURN—(*continued*)—of Small Stock in the several Districts of Cape Colony on 31st December, 1907.

District.	Total No. of Flocks.	Total Number of Sheep and Goats.					Free from Scab.		Under Order to Cleanse.		Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.		Total.	Flocks.	Sheep and Goats.	Flocks.	Sheep and Goats.		
		Woolled.	Cross Bred.	Angora.	Others.							
1. COLONY PROPER Contd												
Sutherland	281	41,506	167,255	...	36,372	245,133	249	215,817	32	29,316	82,912	601
Swellendam	593	173,312	19,305	14,276	66,485	273,378	567	259,098	26	14,280	53,312	2,979
Tarka	869	261,165	31,312	73,277	2,355	368,109	858	361,787	11	6,322	120,608	13,975
Tulbagh		Figures not	obtainable	on account	of change	in the staff.	...	...	...	...	...	...
Uitenhage	1,015	14,474	28,911	162,584	51,168	257,137	998	252,156	17	4,981	53,040	7,190
Uniondale	270	36,865	15,687	40,568	41,392	134,512	265	132,031	5	2,481	29,657	1,650
Van Rhynsdorp	362	16,482	64,914	...	67,878	149,274	360	148,996	2	278	47,825	828
Victoria East	1,145	37,569	5,445	1,095	33,782	77,891	1,140	77,751	5	140	20,256	36,823
Victoria West	604	147,684	210,437	40,015	49,827	447,963	555	410,270	49	37,693	145,389	4,303
Willowmore	874	12,829	63,317	400,115	45,433	521,694	852	509,170	22	12,524	129,667	9,410
Wodehouse	1,410	515,386	21,230	33,147	6,141	575,904	1,391	566,527	19	9,377	161,576	24,600
Worcester	352	31,952	80,530	100	51,260	163,842	350	163,494	2	348	34,850	1,355
Total	60,607	8,482,212	6,083,752	3,366,090	3,816,708	21,748,762	59,667	21,196,050	940	552,712	6,202,197	722,402
2. BECHUANALAND.												
Gordonia	777	...	149,670	...	106,404	256,074	767	253,841	10	2,233	80,886	2,354
Kuruman	642	12,822	48,698	1,497	87,979	150,996	626	148,377	16	2,619	38,316	8,251
Mafeking	1,143	5,430	47,458	2,690	67,496	123,074	917	104,266	226	18,808	38,000	1,500
Vryburg	1,025	65,578	48,469	56,487	45,883	216,417	988	209,082	37	7,335	11,184	...
Total	3,587	83,830	294,295	60,674	307,762	746,561	3,298	715,566	289	30,995	168,386	12,105
3. TRANSKEI.												
Butterworth	1,336	35,327	...	...	21,721	57,048	1,336	57,048	...	...	15,412	13,800
Idutywa	1,699	131,830	...	...	35,920	167,750	1,699	167,750	...	...	43,399	17,500
Kentani	1,842	49,911	...	...	40,688	90,599	1,841	90,434	1	165	16,077	9,380
Nqamakwe	2,883	183,913	...	...	61,066	244,979	2,853	242,929	30	2,050	49,038	32,384
Tsomo	1,370	44,164	...	...	34,786	78,950	1,370	78,950	...	...	15,610	18,589
Willowvale	2,682	34,159	...	...	50,906	85,065	2,682	85,065	...	...	14,402	11,131
Total	11,812	479,304	...	...	245,087	724,391	11,781	722,176	31	2,215	153,938	102,784

RETURN—(*continued*)—of Small Stock in the several Districts of Cape Colony on 31st December, 1907.

DISTRICT.	Total No. of Flocks.	Total Number of Sheep and Goats.					Free from Scab.		Under Order to Cleanse.		Increase of Lambs and Kids.	Losses through Drought and Disease.
		Sheep.		Goats.		Total.	Flocks.	Sheep and Goats.	Flocks.	Sheep and Goats.		
		Woolled.	Cross Bred.	Angora.	Others.							
4. TEMBULAND.												
Elliot	622	128,972	3,266	14,794	4,445	151,477	604	143,226	18	8,251	37,520	1,240
Elliotdale	1,674	4,128	...	...	26,532	30,660	1,674	30,660	...	...	6,693	11,983
Engcobo	2,775	143,578	309	1,748	59,997	205,632	2,673	194,090	102	11,542	47,469	26,030
Mqanduli	2,226	60,268	4	65	45,026	105,363	2,129	94,530	97	10,833	21,268	12,676
St. Mark's	2,151	126,051	260	725	73,976	201,012	2,131	198,990	20	2,022	60,961	42,323
Umtata	2,403	166,387	250	...	47,426	214,063	2,206	193,613	197	20,450	64,159	47,480
Xalanga	905	43,807	...	16,205	16,256	76,268	869	71,309	36	4,959	18,108	8,752
Total	12,756	673,191	4,089	33,537	273,658	981,475	12,286	926,418	470	58,057	256,178	150,484
5. GRIQUALAND EAST.												
Maclear	459	76,853	2,803	7,733	11,519	98,908	449	92,053	10	6,855	19,587	933
Matatiele	1,335	180,485	719	10,970	21,047	213,221	1,335	213,221	...	...	60,942	5,050
Mount Ayliff	753	17,691	...	...	23,872	41,563	753	41,563	...	...	8,950	...
Mount Currie	657	233,965	350	2,964	11,288	248,567	655	247,327	2	1,240	56,806	5,650
Mount Fletcher	1,245	65,779	527	44,412	16,745	127,463	1,244	127,416	1	47	33,421	13,117
Mount Frere	2,169	55,174	...	...	56,480	111,654	2,164	111,099	5	555	13,505	...
Qumbu	1,931	70,472	...	800	42,840	114,112	1,929	113,913	2	199	26,431	8,073
Tsolo	2,180	86,781	21	457	44,802	132,061	2,177	131,816	3	245	31,058	20,586
Umzimkulu	1,938	55,161	3,183	1,040	50,737	110,121	1,934	107,370	4	2,751	19,326	7,516
Total	12,667	842,361	7,603	68,376	279,330	1,197,670	12,640	1,185,778	27	11,892	270,026	60,925
6. PONDOLAND, EAST AND WEST.												
Bizana	2,115	18,969	...	...	28,122	47,091	2,113	47,041	2	50	6,724	5,253
Flagstaff	1,781	17,000	527	...	24,167	41,694	1,781	41,694	...	...	15,122	1,700
Libode	1,944	50,871	...	...	43,706	94,577	1,938	94,147	6	430	11,401	16,967
Lusikisiki	2,755	19,322	...	...	37,784	57,106	2,755	57,106	...	...	10,500	5,350
Ngqeleni	2,284	39,344	...	...	35,574	74,918	2,284	74,918	...	...	17,379	15,790
St. John's	863	1,716	...	...	15,055	16,771	863	16,771	...	...	2,170	4,250
Tabankulu...	2,249	45,299	...	...	57,566	102,865	2,249	102,865	...	...	20,800	11,725
Total	13,991	191,521	527	...	241,974	435,022	13,983	434,542	8	480	84,096	61,035

APPENDIX IV.

REPORT OF THE GOVERNMENT ENTOMOLOGIST FOR THE YEAR 1907.

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1. INTRODUCTORY.—A report, without illustrations or details of special features of the work of the office, is again submitted in compliance with instructions. I desire to record, however, that in my opinion the annual report of an office such as this, the duties of which are or should be largely investigative, should not be restricted in the manner indicated. I think the annual report should be made to serve two objects: first, that of indicating to Parliament the nature of the work performed, and, secondly, that of forming a permanent record of results and observations. The second object seems to me to be much the more important of the two, but in such a report as is now required it can receive scant consideration only. Before this period of acute depression, and consequent necessity for close economy in public expenditure, it received chief consideration, and the reports then submitted are consequently of considerable value for reference. Incidentally they were an incentive to research work.

2. STAFF.—The staff of the Branch at the beginning of the year consisted of the Government Entomologist, two Assistants to Entomologist (R. W. Jack and T. F. Dreyer, B.A.), and Clerk (P. B. Cloete), stationed at Cape Town; and of the Eastern Province Entomologist (W. R. Dewar, B.Sc.), with an unqualified assistant (S. M. Wood) at Grahamstown. The Entomologist was absent on leave from March to September, three months of this time, however, being devoted to the pursuit of information for the Department in the United States. Mr. Dreyer resigned in July to go abroad to study on technical lines, but is expected to re-join the Department after three years. His duty while with the Branch was chiefly the inspection of plant nurseries, and to carry on this work B. J. Graham was recently appointed. For nearly six months the post remained vacant. Mr. Dewar resigned at the close of the year, and has been succeeded by C. W. Mally, M.S., who held the position before, but who resigned two years ago to return to America. Mr. Mally was highly esteemed by a wide circle of Eastern Province farmers, and his re-engagement for work amongst them is very popular. Mr. Dewar voluntarily relinquished the work to return to Canada, his native place. During the last three months of his service he was engaged almost entirely on locust work. S. M. Wood, at Grahamstown, resigned to take up study, and has been succeeded by C. G. Brink.

3. CONTRIBUTIONS TO "AGRICULTURAL JOURNAL."—Articles and notes, as below listed, were contributed by the Branch to the *Agricultural Journal*.

TITLE.	Vol. and Issue.		Pages.
Citrus Failures in Albany and Bathurst	Vol. XXX.	January.	42–49
Poisoned Bait for the Fruit Fly	" "	February.	192–195
Over-sea Plant Import Regulations	" "	"	232–236
South African Inter-Colonial Plant Import Regulations	" "	"	237–242
Vine Mildew or Peronospora. Its discovery	" "	March.	330–332
Antherea tyrrhea. Caterpillars destroying Trees ...	" "	"	358–361

Title.	Vol. and Issue.		Pages.
Introduced Borer-Beetle (Phorocantha recurva) ...	Vol. XXXI.	August.	140–141
The Locust Plague. Notes	,, ,,	,,	168–174
The Fruit Fly. Notes	,, ,,	,,	186–187
Vine Mildew. General account	,, ,,	September.	324–330
Arsenate of Lead. Notes	,, ,,	October.	373–375
Stock influences in Citrus Culture Notes	,, ,,	,,	375–378
Fruit Fly and Paraffin Oil	,, ,,	November.	497–499
Damage to Bees by Spraying. Notes	,, ,,	,,	505–506
Vine Mildew. Discussion of how spread and Danger to Western Province	,, ,,	,,	564–574
Plasmopara in Algeria	,, ,,	December.	659–664

4. **Plant and Fruit Import Regulations.**—The supervision of the Plant and Fruit Import Regulations is undertaken by this Branch, and involves much work of routine character, far more than is apparent from the accompanying return of the number of cases of plants and fruits inspected. The inspections at Cape Town are made by Mr. Jack, or in his absence by the writer. At Port Elizabeth they are made by the Superintendent of Parks, J. T. Butters; at East London by the Surveyor of Customs, T. G. H. Orpen. Nothing liable to inspection was received during the past year at Mossel Bay, the only other port through which oversea plants and fruits are allowed to enter. Imports from oversea by post are examined by these officers, or on behalf of this office by the Curators of the Municipal Gardens at Kimberley and King William's Town. All oversea parcels pass through the post office at one or another of the towns mentioned, and any that contain plants are detained for the examination. The following table does not include post consignments. The number of such examined at the Head Office alone was 109, of which 59 were fumigated, as required by the regulations.

Trees, Plants, Fruit, &c., Inspected and Fumigated Jan. to Dec., 1907.	Cape Town.			Port Elizabeth.			East London.			Totals.		
	Lots.	Cases.	Cases fumigated.	Lots.	Cases.	Cases fumigated	Lots.	Cases.	Cases fumigated.	Lots.	Cases.	Cases fumigated.
Oranges	23	1,908	103	9	269	15	2	32	32	34	2,209	150
Lemons	16	727	81	8	283	...	...	...	...	24	1,010	81
Apples	59	9,313	128	17	790	...	...	...	...	76	10,103	128
Other Fruit	42	785	12	39	186	8	1	3	3	82	974	23
Fruitbearing Trees and Plants	10	16	16	1	1	1	4	14	14	15	31	31
Fruit Tree Stocks ...	5	6	6	2	5	5	1	1	1	8	12	12
Other Trees	5	8	8	...	...	...	2	2	2	7	10	10
Garden Plants	73	136	90	54	118	118	7	18	18	134	272	226
Greenhouse Plants ...	10	20	...	4	6	...	...	...	...	14	26	...
Bulbs, &c.	31	45	...	70	80	...	2	5	...	103	130	...

The burden of this work arises chiefly from the fact that there is not sufficient of it to take the full time of an officer, while when consignments arrive they must be given attention without delay. At Cape Town fully as much time is spent in the journeys to and from the Docks as in the actual inspections, but this is unavoidable, as at this port it is deemed quite necessary to have the inspections made by a qualified officer. Seven cases of plants, comprising fifty cases in all, were inspected at the places of destination instead of at the Docks. This procedure is followed, in the case of importations for conveniently situated nurseries where fumigation facilities are provided, whenever practicable, since it admits of a thorough examination without the necessity of repacking the plants. The lemons and oranges which were fumigated were from Southern Europe, and bore one or another of the species of scale insects common there, several of which this country has so far escaped. The apples fumigated were from Tasmania, and were infected with *Lepidosaphes ulmi*, a bad scale unknown here. Long experience has shown that absolute absence of scale from fruit is practically unattainable, but now that importers realise that none but carefully selected consignments will be passed without fumigation, most of the fruit imported is as free of scale as the standards which we have established. The apples imported were mostly from Canada and in barrels. Several small consignments of Madeira apples, aggregating 115 cases, were refused admittance owing to Fruit Fly infestation; some of the fruit was destroyed and the rest sold to outgoing steamers or sent to German territory. All plant imports of woody nature are fumigated as a precautionary measure. Nearly all this year appeared to be quite free of injurious insects not already common in this country, but one consignment of apple stocks from England, and one of roses from Holland, were found infested by the highly pestiferous Mussel or Oyster shell scale *Lepidosaphes ulmi*, and a quantity of gooseberry bushes from England were thickly infested with immature specimens of a

Lecanium not known here. The great strength of the plant import regulations now lies in their restricting introductions of trees of all kinds and all fruit bearing plants to small numbers, and requiring that a special permit be obtained to get these. No permits are issued for any plants intended for sale by auction, for plants readily reared from seed, or for such as are known to be procurable in the country. Only fifteen special permits were issued during the year, and most of these were for parcel post consignments, but a large number of applications were refused for one reason or another. Various plants which arrived without permits having been obtained for their introduction, had to be destroyed; most of them were of restricted or prohibited kinds, intended for sale by auction.

5. NURSERIES INSPECTION AND QUARANTINE ACT.—Under this Act, passed in 1905 (No. 29), all nurseries of plants and trees in the Colony are registered by this office and inspected for injurious insects and diseases. The number of nurseries, as shown by the official list, at the close of the year is 198, of which 159 are registered as "general" and 39 as "local." By the provisions of the Act local nurserymen are not obliged to cleanse their stock of pests that may infest it, but are prohibited from sending any plant by railway or other public carrier, or from having it taken by any means outside of the district where it was grown. At present general nurserymen are obliged to fumigate with hydrocyanic acid gas all fruit trees before despatch, and also trees and plants of other kinds if certain scale and aphis pests have been found there.

To give force to various provisions of the Regulations, no consignment of plants is now received for despatch by rail unless it is accompanied by a prescribed form giving particulars of the number and kind of plants comprised in the sending and the name and address of both consignor and consignee. The form ultimately comes to this office. In this way, we get to know if any shipment contrary to the Regulations is made by a nurseryman, and if any shipments of consequence are made by parties whose premises are not registered and inspected.

With a few exceptions amongst the smaller nurseries, the nurserymen have striven hard to get their stock free of scale insects and other pests, and the improvement effected has, on the whole, been fairly satisfactory. The prevailing depression has been severely felt by the nurserymen, and in consequence it was not deemed advisable during the past year to apply harsh measures. Nevertheless a great amount of cutting and burning, fumigating, and spraying was done, and it is now felt that it will be feasible during the coming year to apply more stringent measures. Therefore, the Red Scale (*Chrysomphalus aurantii*), the Circular Purple Scale (*C. aonidum*), the Ross Black Scale (*C. rossi*), the Purple or Mussel Scale (*Lepidosaphes beckii*), the Glover or Long Scale (*L. gloverii*), the White Peach Scale (*Aulacaspis pentagona*), and Woolly Aphis (*Schizoneura lanigera*), have all been proclaimed "pests" within the meaning of the Act, and any plants in "general" nurseries found infected by these insects, as well as any within eight or twelve yards of plants found infested, will be held in quarantine until at a subsequent inspection the reason for the quarantine is found to have been removed. The Red Scale, White Peach Scale and Woolly Aphis are very common pests, and it is feared that few nurseries where their host plants are grown are entirely free of them, although the infestation is trivial in almost every case compared to what it was two years ago. The Circular Purple Scale was well established in two florist nurseries, but one now seems free of it and the other nearly so. The Ross Scale is common in the Transvaal, but the Cape nurseries have escaped it. The Purple (Mussel) Scale was found in one nursery, but has been there exterminated. The Glover Scale was found near nurseries, but not on any nursery stock.

The Nursery Act has many grave faults, but it is not deemed expedient at the present time to discuss these specifically and suggest amendments. It is believed that a great measure of good may be accomplished by a judicious use of the Act as it stands, and that in a few years there will be a far better prospect of getting an amended Act through Parliament than there would be at present. A nurserymen's association was recently formed, and useful suggestions in regard to nursery legislation may be expected from this body later on.

This seems a fitting place to call attention to a real hardship from oversea competition to which the Colonial industry is exposed. It is becoming more and more the custom with each recurring season for large Holland nurseries to make large shipments of ornamental nursery stock to this country for sale by public auction. These shipments are nearly all made at the close of the European selling season, that is, at a time when the plants sent would sell for a very low price, if at all, where they were grown. In other words, they consist largely of surplus stock which it pays the sender to sell in this country at any advance over shipping and sale expenses. The inspection records show that 110 cases of such stock were imported through our ports from Holland during 1907. The number of plants in a case is variable, but frequently it is over a thousand. Rose plants are most numerous, but there is almost always a large assortment of Azaleas, Rhododendrons, Aucubas and other relatively expensive ornamental shrubs. The Cape nurserymen claim, and it is believed that they are right, that a great part of the plants are of kinds or varieties which are unsuitable for the South African climate. The general public, however, seems to think only of the price, and the sales are generally well attended. The prices obtained are commonly ridiculously low, judged by Cape standards, but the fact that the shippers tend to send more and more consignments shows that they are not to be discouraged by low prices. It is suspected that a small margin over packing, shipping and sale expenses is sufficient to satisfy them. The imposition of a heavy tariff on plants has been suggested as a means of minimising the evil, but surplus stock, such as is sent for auction sales, would be valued so low that it is probable a heavy tariff alone would not only fail to have the effect desired, but would severely penalise nurserymen in the importation of the relatively expensive plants they themselves require.

The nursery industry of the country is one to which the Government should give special encouragement. This view is held by the writer, not because it is one of those industries of the soil which requires little oversea expenditure in any form, but because with every importation of plants there is a danger that some new pest or disease may reach the country, and, having reached here, become established and remain for ever. The danger with any particular plant, and even with a whole consignment, may be very remote and indefinable, yet it is there, and in the long run innumerable troubles are introduced, doubtless with plants, although no one knows when or where. The danger is less with high priced selected stock than with the general run of stock, and, other things being equal, is proportional to the quantity imported. It would be better to take all the pests that may come rather than deprive the country of improved varieties and novelties produced in other countries, so the writer does not suggest an absolute prohibition on plant imports, but advocates severe restrictions to increase the quality and decrease the quantity. He would like to see a heavy duty placed on all plants, in order to check the petty and needless importations by private parties that now take place, and the larger and almost equally needless importations of some nurserymen; and he strongly recommends that importations of plants for sale by auction be prohibited. Regulations now in force for the protection of horticultural and forestry interests restrict introductions of all trees and fruit bearing plants to limited numbers introduced under special permit, and no plants of these kinds are allowed to be imported for sale by auction, hence only ornamentals remain to be stopped. It has to be added that the auction sale consignments are inspected when they arrive, and are given a precautionary fumigation with hydrocyanic acid gas; but these measures are utterly inadequate to guard against many troubles which might be present. Increased prices need not be feared as a result of decreased introductions, that is, as regards stock sold in the ordinary way of trade. Instead, prices would probably tend to decrease, owing to increased business. It was freely predicted when the introduction of fruit trees was restricted some years ago that prices would rise; but they have fallen through the development of a healthy internal competition, and the quality of the stock sold has greatly improved. The same may be confidently expected of ornamentals. The fact that to restrict ornamentals as suggested may require greater legislative powers than the Government now possesses is the chief reason for digressing on these matters to this extent.

6. Animal Diseases Experiment Station.—This Station, located at Rosebank, near Cape Town, is for the joint use of the Veterinary and Entomological branches of the Department in the investigation of animal diseases, particularly with reference to the transmission of infection by ticks. The Entomologist is responsible for its upkeep. The shortage of staff in both branches, and the necessity for strict economy in expenditure, has prevented much utilisation of the Station for its special purposes during the past year. Two helpers only, both coloured, are now retained, and the Station is used chiefly for miscellaneous work, for which it is a great convenience, and now well nigh indispensable to both branches.

Early in the year considerable time was expended in doing necessary preliminary work for a study of the transmission of Blue Tongue or Malarial Catarrhal Fever of Sheep. This disease has many striking resemblances to Horse Sickness, and there are strong reasons for suspecting that both are transmitted by mosquitos. Therefore, elucidation of the channel of infection in the case of sheep disease may be expected to facilitate the discovery of how Horse Sickness is conveyed. Field studies of mosquitos were made about Cape Town, Stellenbosch and Kei Road, and material of likely species collected. Attempts were then made to feed mosquitos on affected sheep, but the season passed without any single test being carried to a satisfactory termination. Great difficulty has so far been experienced in getting the mosquitos to feed on the animals. It was planned to continue the work during the present summer, but the pressure of routine work has necessitated a postponement.

Biliary fever of the horse, caused by *Piroplasma equi*, has been successfully transmitted by the Red Tick (*Rhipicephalus evertsi*), pathogenic specimens of which were kindly supplied by Dr. A. Theiler, the Transvaal Veterinary Bacteriologist. Thus far our tests with other kinds of ticks have proved negative, but they have not been fully satisfactory. To conduct tests with horses properly would require greater expenditure than would at present be allowed. For instance, apparatus for holding the horses securely, but without harming them, should be provided. To be sure that the animals have not had the disease already, imported ones are used, and for the sake of economy these are the cheapest Argentine ponies to be had, and to feed ticks under cover on these half wild brutes involves some exciting moments under present circumstances.

Some work with Heartwater has been done to bear out previous work, and infected ticks have been kept on hand for tests of alleged remedies. A test of the immunity or otherwise of woolled Persian sheep has been arranged. Infected ticks have been sent to the Veterinarian of the British Board of Agriculture, and several lots to Dr. G. H. F. Nuttall, the Quick Professor of Zoology at Cambridge University. We are in hopes that the Cambridge scientists will take up the study of this perplexing disease, the causal organism of which has not been discovered. They have succeeded very well in the technical study of the organism of Malignant Jaundice of the Dog. Their pathogenic tick material to produce this disease was all supplied by us. Our own work with Malignant Jaundice has not yielded any new discovery.

Tests of various substances for tick destruction have been made, and will later be reported on in detail. The chief value is in showing that several substances advertised as tick destroyers are really of little use for the purpose.

7. LOCUSTS.—As was predicted in the last annual report would probably be the case, the Colony suffered a greater infestation by the Brown Locust (*Pachytylus sulcicollis*) during the season now ending than it had experienced since 1893. The tabulations of the Inter-Colonial Locust Bureau show that the pest ranged from almost as far north as the Zambesi, south into the Uitenhage and King William's Town Divisions of the Cape Colony, and from the Drakensbergen on the east to the Kalahari Desert and Namaqualand on the west. The heaviest infestation occurred in the southern half of the Orange River Colony, the western part of Basutoland and the northern half of the eastern part of the Cape Colony. The Cape Colony divisions which suffered most were Herschel, Aliwal North, Burghersdorp, Colesberg, Philipstown, Steynsburg and Queenstown.

All the Colonies and territories this year took active steps to cope with the pest. It was not certain that the Cape Government would provide funds for the purpose until late in September; but then, within a week of the time voetgangers began to appear, £5,000 was granted. It was clear that much more than this sum could be expended to advantage, but as more was not likely to be forthcoming, a plan of operations which would not require more was decided upon and carried out. When the accounts are complete it will probably be found that little remains unexpended. With more money to count on much more work would have been planned and the objects more nearly accomplished. The general scheme comprised the appointment of a locust officer for each district where the pest was expected to appear, and the free issue of ingredients for the sweetened arsenical spray which, in the past few years, had given excellent results in Natal and the Transvaal, and had already passed beyond the experimental stage in some districts of this Colony. The instruction of the various district locust officers and supervision of them was entrusted to two officers of the Department, W. R. Dewar, the Eastern Province Entomologist, and R. W. Thornton, assistant to Dr. Nobbs, the Agricultural Assistant. The district officers were selected by the Resident Magistrates of their respective districts. Appointments were first made for the districts of Herschel, Aliwal North, Albert with Molteno, Steynsburg, Colesberg, Phillipstown, Cradock, Middelburg, Graaff-Reinet, and Jansenville, with Mr. Thornton in charge; and for Barkly East, Wodehouse, Tarka, Queenstown, Glen Grey with St. Mark's and Tsomo, Butterworth with Nqamakwe, Cathcart, Stutterheim, Bedford and Somerset East, with Mr. Dewar in charge. Subsequently appointments were also made for Mafeking, Vryburg, Taungs, Kimberley with Herbert, Hope Town, Barkly West, Aberdeen, Hanover with Murraysburg and Richmond, with supervision vested in Mr. Thornton, but less was attempted in these districts than in those farther east, where the pest was present in greater abundance, and where more crops are grown. In the cases in which two or more districts are grouped together in the above lists one officer was made to serve for all. The total number of district officers was 29, and the total number of districts in which they had to work was 38. Exclusive of the districts in Bechaunaland, Griqualand West and Hope Town, where little was attempted save along the border of the other Colonies, the area in which work was done approximates 45,000 square miles.

The district officers were given to understand that they were not employed merely to destroy locusts, but more, by personal visit and demonstration when possible, to bring to the notice of the farmers throughout their areas the surprising efficacy of the poisoned spray, and to do all in their power to induce the leading farmers to adopt it, thus to get the remedy known and popularised in every neighbourhood. In some districts half-a-dozen officers would have been none too many for this work, but it was considered that one only could be afforded. However, extra white men were engaged in certain native areas where it was expedient to have white supervision of spraying operations.

A central depôt for the supplies was established at Naauwpoort, the Railway Department kindly granting the use of storage accommodation and other facilities which have been of immense assistance. The Railway Department further helped by assenting to the employment of W. P. H. Andrews, Chief Clerk to Railway Engineer at Naauwpoort, as officer in charge of the supplies. His management of affairs has been highly satisfactory. From Naauwpoort supplies as required were sent to Resident Magistrates on their requisition, and the Magistrates made the distribution to the farmers. To economise supplies as well as to minimise the risks, ten pounds of arsenite only were, as a rule, issued to a farmer at one time. Thirty pounds of sugar were sent with each ten pounds of the arsenite.

The lack of preparation severely handicapped the work at first, and the locusts were nearly half grown in some districts before the work was fully under way in them. Fortunately, a small supply of pumps had been ordered on the chance of work being undertaken, and a shipment of arsenite which had been ordered for prickly pear destruction was taken over; these supplies arrived early in October. Altogether about 1,500 pumps were issued on loan for the work. Probably as many more would have been issued had they been available. One only was loaned to a farmer, and one often had to serve for several farmers. About 14 tons of the arsenite were distributed to the Magistrates, and about 9 tons of this passed into the hands of farmers and others for actual use. The issue of syrup was three tons and of sugar about 40 tons. The assistance which the Government was prepared to render was given extreme publicity, and a memorandum detailing measures applicable for locust destruction and dealing at length with the use of the arsenite preparation was distributed by the police.

Viewed as a whole the results of the work are very gratifying. To a great extent the success in any given district depended on the tact and ability of the local locust officer, and naturally far more was accomplished by some officers than others. In some of the western and southern districts there proved to be little to do. In the districts along the northern border all the men worked well and aroused considerable enthusiasm, but in one of the most important midland districts the officer, though apparently energetic enough, seemed quite unable to get the farmers to bestir themselves, the majority refusing to try the arsenite, either because they feared to poison stock or because of religious scruples. The officers sent in weekly reports showing what farms they had visited and the results of their work there. Only a few, however, induced the farmers to keep them posted on the number of swarms destroyed, obviously not an easy matter, and hence there is little foundation on which to frame an estimate of the number of swarms accounted for. The Queenstown officer, a particularly painstaking man, makes the proud boast that not a single swarm in his area was allowed to get to the winged state, no less than 2,007 having been annihilated. In all districts probably 10,000 to 20,000 were destroyed, but, as intimated, this of necessity is merely a rough guess. The benefits of the work were not wholly immediate, and indeed it is probable that the chief benefits will prove to be the preservation of the winter veld and crops from the vast swarms which would otherwise have become winged and doubtless have remained in the Colony. Without the work, the Colony would probably be as badly infested in the coming season as in the past one, whereas there are indications that locust birds will now be able to decrease the swarms that escaped the great killing to so great an extent that the infestation in the season to come will be comparatively light. It seems quite safe to say that the saving through the work is worth six to twelve times the expenditure; and the majority of the farmers throughout a vast area are now in possession of a remedy against the pest which is far simpler and more effectual than any remedy previously known to them. Soap spraying to destroy swarms has been regarded as profitable, but arsenite spraying at less than a tenth the cost has been shown to give much better results.

The fear of poisoning stock was by far the greatest obstacle to overcome in inducing farmers to use the arsenite. The delay in getting the work started intensified this difficulty, for before our officers could get the safety of the measures demonstrated by experience, exaggerated stories of heavy stock losses in the Orange River Colony had been told on almost every farm. As the work progressed the claim that the poison could be used with safety, if only simple precautions were exercised, was fully borne out, yet a number of unfortunate losses occurred. The officers were instructed to report fully on every case that came to their notice, and these reports show that in almost every case the losses were clearly due to negligence, chiefly either by allowing stock to fill themselves on newly poisoned grass or forage, or by using a solution much stronger than was recommended. Thus one party lost two horses by allowing them to eat barley soaked in the poison overstrong at that. Another used a pound (many times too much) of the poison on five yards square of kweek grass, and neglecting to keep his cattle off, lost four cows in consequence. Another mixed four pounds in two gallons of water when he should have used about 50 gallons and splashed not sprayed this over vegetation growing by a small pool from which his cattle drank; he lost three. Altogether the losses reported as suspected of being due to the work were 5 sheep, 2 horses, 23 calves, 49 cattle and 18 ostriches. On investigation some of these losses were found to be due to other causes entirely, and in other cases there is also good reason to believe that arsenite was not the cause of death. The reported losses which were due probably to the work total to 2 sheep, 2 horses, 13 calves and 41 cattle. Some of the farmers who met with losses were broadminded enough to realise that the fault was with them, not with the remedy, and to go ahead using the arsenite. It is quite probable that if the use of the poison becomes thoroughly popularised, the losses in years to come will be much less than in the present season, even though vastly more locusts are destroyed, because it may be expected that experience will teach the necessity of the precautions, where mere instruction has failed. Moreover, if the poison is properly used against the newly-hatched locusts, as it should come to be used, there will be less risk to stock than when older locusts are treated as was the case this season in most districts. A very little of the poison goes a long way in killing the young ones. Many ostrich farmers report that they have fed their birds on poisoned locusts without any bad effect.

An innovation of the season was the use of poisoned forage, the advantage over spraying being the smaller quantity of water required. Green barley cut up very finely and soaked for a quarter hour in a solution of a pound of the poison and three or more pounds of sugar in twelve gallons of water was a favourite bait. Thinly scattered in front of swarms it was a certain attraction to them, and an equally certain death. A bag filled with it, tied and slung across a horse, and then slit across the middle so that it hangs to either side like two great pockets, can easily be made to effect the destruction of a swarm many miles from water. When necessary, cut up dry grass and bushes can be used to hold the poison instead of fresh grass or forage, it being made attractive by the use of an increased proportion of sugar. Therefore, the arsenite remedy is applicable on farms where there is a scarcity of water and no crops.

It is urged that the work be continued, and that a sum of not less than £10,000 be provided for the season of 1908. A campaign on the same lines as carried out in the season now past, but with more officers and more supplies is advised. If, as now seems probable, there proves to be less of the pest in the more thickly settled parts of the Colony which were invaded this year, the money can very profitably be expended in northern and north-western districts where little was accomplished this year, but where vast swarms are bred which migrate east and south-east into farming districts. The other Colonies are of opinion that the Cape should have done much more towards destroying the pests in the season now past. Both the Orange River Colony and the Transvaal appropriated double as much money for their operations, and were able to conduct campaigns on much more vigorous lines, and as the destruction of locusts is a matter on which concerted action throughout South Africa is urgently desirable, they think the Cape should do its fair share. The O.R.C. provided 5,000 pumps and forty to fifty tons of arsenite for this season's work, or three to four times the quantities provided by the Cape, which had a much greater infested area. Rhodesia expended about £4,000.

The question of compulsory destruction of locusts should receive early and serious attention from the Government. The feeling amongst progressive farmers in many parts of the affected area seems very strongly in favour of a compulsory measure inasmuch as the neglect of any one farmer to kill the swarms that hatch in his place generally causes more loss to others than to himself. The expense to the farmer need be trifling only, for one or two hours' work will suffice for spraying that will be sure death to an average swarm. A single gallon of the poison is sufficient for 50 to 150 square yards of veld according to the height and density of the vegetation. The O.R.C. and Natal have compulsory legislation, and it is understood that the Transvaal is to consider its advisability. This year the O.R.C. farmers along the Orange River felt they had a grievance in that their neighbours across the stream were not compelled to destroy voetgangers as they were. Swarms of voetgangers were said to cross the river and re-infect O.R.C. farms that had been cleared. The Transvaal made similar complaints with respect to some parts of the Cape border.

Last year's report contained notes on the retention of vitality by locust eggs kept for a lengthy period under conditions unfavourable for hatching. It has now to be added that eggs collected in the winter of 1904, and which normally would have hatched about October of that year, are still alive. Some were hatched in early January, 1908. In this connection, it is worth mentioning that far larger quantities of eggs were laid in some of the Midland districts last winter than have since hatched, and it is accordingly supposed that large numbers in a sound condition are sitll in the ground. The season in those parts has been very dry, and the hatching that has occurred has been very irregular. Voetgangers were still appearing when the swarms in other parts, more favoured by rain, had begun to take wing.

8. PLASMOPARA VINE DISEASE.—The work of the Branch is supposed to be confined to insect matters, but of necessity no inconsiderable portion of the time of both myself and assistants during the past year has been given to subjects which are in no sense entomological. In former years much of such work devolved upon the Botanist, and properly should have the attention of a plant pathologist. No one has been appointed in the place of Dr. MacOwan, the late Botanist now retired, and although the appointment of a plant pathologist has been under consideration for many years, and has again and again been urged by me in the annual reports and special memoranda, no steps have yet been taken to get one. My knowledge of the conditions enables me to say that the fungus and bacterial diseases of cultivated plants in this country are increasing in importance much more rapidly than are insect pests, and the services of a competent plant pathologist is now one of the most pressing needs of the Department of Agriculture.

The writer firmly believes that if the Department had had a trusted plant pathologist on its staff during the past year, the greater part of the annoyance and expense that has occurred through the outbreak of the vine disease "Mildew" or "Plasmopara" in eastern districts would have been avoided, and incidentally my Branch would have been spared the grave interference with its own field of work which has been caused. The saving to the public purse in this one matter, in the writer's opinion, would have far more than offset the expense of a fully qualified pathologist. At present the Transvaal is the only Government in South Africa which has an official pathologist, and were it not for this officer, Mr. I. B. Pole Evans, the discovery of the vine disease might not have occurred yet. To expedite his becoming acquainted with the fungoid diseases of South Africa as a whole, as well as to obtain identifications for our own information, the writer and his Eastern Province assistant, have sent him specimens of diseased plants from time to time. Thus Plasmopara was brought to light in late January of the past year.

The Department was not only without botanist and plant pathologist, but viticultural expert as well, and, under these circumstances, it was unavoidable that the brunt of the field work in connection with the disease should fall on the entomological staff. Unfortunately, the Transvaal Plant Pathologist took the view that the disease is of such serious importance that no plant produce should be allowed to pass from an infected area to his Colony, and that the eradication of the disease, by the destruction of all vines where it occurred, should be attempted. Such views the writer holds to be utterly unjustifiable, but their exposition by the only official plant pathologist in the country very naturally aroused impractical demands on the part of Western Province wine farmers, and vastly increased the difficulty the Department had in dealing with the matter. The arguments brought forward by the Department in favour of the attitude it adopted, though apparently sound and backed by weighty experience of other countries, were heavily discounted by the farmers because they did not emanate from an acknowledged expert on fungoid diseases; and under the circumstances the farmers cannot be blamed for their fears that the Department was not taking all the steps that were advisable.

Accounts of the disease, written by this Branch, and amongst them dealing with nearly all phases of the subject, appeared in the "Agricultural Journal" for the months of March, September, November and December. The main facts merit repetition here.

Plasmopara is a " downy mildew " of the vine akin to the downy mildew of the potato, the blight which in some seasons causes immense losses in Europe and America, and which is not unknown at the Cape. The fungi which cause these diseases are capable of extremely rapid development and multiplication when they meet with particularly favourable weather conditions ; while, on the other hand, without the combination of circumstances which specially suit them they may give no trouble whatever, and even not be discoverable by an expert, in localities where at other times they are very prevalent, and where it may be, therefore, assumed that their infection is continually present. A succession of soft, warm rains with intervals of hot sultry weather favours the development, while a low temperature, dry heat, and dry wind check it. It follows that such diseases are far more to be feared in some countries than others, and that the damage they inflict varies immensely from season to season at almost any one place.

The disease first became known in America, where it occurs throughout the Eastern States. It reached Europe about 1878, and by 1882 had spread from France south across the Mediterranean Sea into Algeria, north to the limits of vine cultivation, and eastward into Russia and Turkey, thus in four seasons establishing itself over an area many times the size of the Cape Colony. It has also reached Argentina where, though widespread in the country about Buenos Ayres, where about two-fifths of the rainfall is in summer, it appears to be quite unknown in the dry western districts where the vine is chiefly cultivated. In Europe the disease varies greatly in importance from place to place, but on the whole it is probably the worst of the many vine maladies. Spraying with copper compounds was found to be an effectual preventive almost as soon as the disease was introduced, and has long since become an established practice amongst the more progressive viticulturists wherever there is much danger of an outbreak. The danger, as a whole, is greatest in the humid valleys of Germany, and relatively little trouble is experienced in the comparatively dry climate of the southern countries. In Algeria three to five sprayings are required to safeguard vineyards near the coast whereas the vineyards in most inland parts are quite safe without any preventive treatment.

The climate of the Cape Colony cannot be regarded as particularly favourable for a disease of the nature of Plasmopara. The rainfall is too much in the form of heavy showers, the intervening periods are too dry, and there is too great a prevalence of high dry winds. But in some years the weather conditions in the coastal districts and river valleys of the summer rainfall sections, and often perhaps also in some restricted localities in the vine area of the south-west, are sufficiently hot and humid to render severe outbreaks quite possible if only sources of infection are present. In the Eastern Province very little attention is given to vines ; most of the districts are recorded by the last census to have a matter of hundreds only while most western districts possess millions. That vine diseases are more rife in the eastern than in western parts has long been recognised, but no one has troubled to study the diseases to ascertain if they were only of the same kinds known in the western parts, but there of much less consequence owing to climatic factors. Therefore when, quite by chance as explained above, the presence of Plasmopara at Grahamstown was determined, the question of whether the disease was a recent introduction or one long established and perhaps widespread, and only brought into prominence by the character of the season had to receive attention before the Government could wisely consider drastic action with a view to stamping out the infection. The summer of 1906-1907, in the part where the trouble was found, was remarkable by the frequency of warm drizzling rains and therefore conducive to the appearance of such a disease. Then there was no special reason to suspect a recent introduction of the malady. For many years the Government had maintained a prohibition on the introduction of vines by the public and of late years this measure had been enforced with particular stringency. Fifteen or more years ago, however, immense quantities of vines (American stock varieties) had been imported and grown for some years at Fort Cunynghame, in the Stutterheim district, and it seemed not at all unlikely that the disease had come in at that time. Further, soon after the disease was recognised, Dr. Schönland, of the Albany Museum, drew attention to a record in an authoritative German reference work on Botany, that the fungus in question occurred in Cape Colony. This work was published in 1897. Unfortunately the author has since died, and we have been unable to trace his authority for the statement.

The news of the discovery of the disease at Grahamstown reached Cape Town on January 28th, and received affirmation on February 3rd. In view of the possibility of its being a recent introduction which might prove a serious addition to the pests of the vine, precautionary action was taken at once. The spraying of the vines in the Grahamstown nurseries was arranged for, and an immediate prohibition placed on the despatch of any from the premises. As already commented upon, the Department is without botanist, plant pathologist and viticultural expert, and under these circumstances this Branch took the responsibility of advising what preliminary actions to take. The E. P. Entomologist was sent on a tour of inspection through the Midlands, one Cape Town assistant to the eastern frontier, and the other assistant to the western centres where it seemed most likely the disease would be found were it in this part of the country. The inspections, of course, were very hastily made, and only the chief towns were visited. Meanwhile a formal Proclamation prohibiting the removal of any vines and grapes from the Albany district was gazetted. The Manager of the Government Wine Farm was informed of the discovery on the very day the first news of it was received, and he was asked to be on the sharp look out in Constantia, which part was visited a few days later by the writer. But in these preliminary inspections the trouble was seen only in the immediate vicinity of Grahamstown, in consequence of which the Department took the precaution to have the vines growing in the infected nurseries uprooted and burned. The failure to find the disease by no means proved that the disease was quite absent from the places inspected. As explained above, the infection might have been present and no one able to prove or disprove the fact. The weather conditions had been specially conducive to the disease at Grahamstown, and there seemed to remain a strong likelihood that the disease would only show at other places where it occurred much later in the season ; in Europe and America there are many parts where it rarely appears until late. The disease can spread hundreds of miles in a single season, as is evident by the European experience. But vines are so few and far apart in the east of the Cape Colony, and the country so broken by mountains, that a slow and erratic spread would naturally be expected there, and not a swift and searching one as where vines are cultivated extensively. Later inspections of the same places and of other parts of the Colony were made by Mr. Watermeyer, the Manager of the Government Wine Farm, and by the assistants in this Branch ; and as was feared would be the result, the disease was found to be widespread in its occurrence. It was placed in the Stockenstrom and Fort Beaufort districts in late March, in Queenstown April 14th, Somerset East April 19th, Uitenhage, Graaff-Reinet, King William's Town and East London April 22nd–26th, Aberdeen, Jansenville and Humansdorp (extreme east of district) May 8th–10th, and Middelburg late in May. Places further north and west were visited, but no trace of the trouble noticed.

Meanwhile, chiefly in order to be able to take drastic steps promptly, if such were decided upon, the Government promulgated regulations authorising the declaration of infected areas and the destruction of all vines within them, and limiting the removal of plant produce from premises where the disease was actually found. About the same time (April 16th) a somewhat alarmist article on the disease from a Pretoria correspondent appeared in a Cape Town daily paper, and then at once the subject sprang into prominence. A meeting of the Western Province Board of Horticulture was held on April 19th, and a few days later, on representations by a deputation from that body, the Government agreed to provide free railage to Grahamstown for a party of representative western wine farmers in order that they might be able to recognise the trouble at once should it appear in their sections. About 30 delegates went. A meeting for them was held at Grahamstown on April 27th, at which Dr. Schönland, the Botanist of the Rhodes' University College, and long Curator of the Albany Museum, gave a clear account of the disease and urged that the Government not take drastic action in regard to it without first making a careful study of the matter. His wise counsel, however, was disregarded at the time, largely owing to the influence of the Transvaal Plant Pathologist who, quite unmindful of the practically insuperable difficulties of such a course, advised a prohibition on the removal of plant produce from the area which was infected or which might with reason be supposed to be infected, and also an attempt at eradication of the malady by the destruction of vines. On May 21st the Government issued amended regulations. These forbade the removal to any other part of South Africa of trees, plants, vegetables, fruit, and seed, from an area which is roughly the eastern half of the Colony, made reporting the presence of the disease obligatory on the part of occupiers of property, and retained authority to have infected vines destroyed without compensation. The Transvaal soon after, June 5th, prohibited the introduction of plant produce from an even larger area, and Rhodesia followed her example. Thus all because of a disease which spreads almost wholly through the atmosphere, which may have been many years in the country, and which is not to be feared except amongst vines and under weather conditions not common in South Africa away from the coast, the trade relations in plant produce of the whole eastern half of the Colony with all the rest of South Africa was completely disorganised. The Transvaal even went so far as to apply its restrictions to brandy and wine. Perhaps the most unjust feature of the matter was that no similar prohibitions were or have yet been placed on plant produce from other infected countries. The Transvaal has even continued to import fresh grapes from the south of Europe, and Rhodesia has authorised the introduction of a large number of vines from Italy. The writer had gone to America in early March, and when he learned of these harsh regulations, he cabled to the Department that the danger was being exaggerated, and that eradication was impracticable. Soon after he went to Washington and secured a discussion of the disease with the strong corps of the United States Department of Agriculture plant pathologists, and as a result was able to cable that these gentlemen agreed with him. Later he visited leading plant pathologists in other parts of the country, including California, and got their opinions on various phases of the subject ; and the information he acquired strengthened his conviction that it was futile to attempt to eradicate the disease, and that measures to check its spread, other than by a prohibition on the removal of vines and grapes from infected into clean areas, was not commensurate with the expense and inconvenience involved. The Cape Government soon realised the unwarranted oppressiveness of its regulations, and under date of July 2nd published an amended schedule which permitted the removal of plant produce other than vines and grapes on condition the packing material, etc., was disinfected, and which said nothing about destroying infected vines. Pressure was then brought to bear upon the Transvaal to modify its prohibitions and was partly successful, it being agreed that produce accompanied by a sworn declaration that it was grown at least a quarter-mile from vines would be accepted ; nursery stock, however, was ruled out altogether, and to the time of writing is still excluded. The revised Cape regulations did not please either East or West and have since been superceded by simpler provisions, recommended by the writer since his return, which should prove more satisfactory for both parts of the country ; they are fully explained in the *Agricultural Journal* for February, 1908. The writer fully believes that had the Department had a practical plant pathologist on its own staff, regulations at least as simple as those which have now been adopted would have been published at the beginning, and that the wine farmers would have been quite satisfied that the Department was amply protecting their interests. It may be mentioned in dismissing the subject that the dependence of the disease upon certain weather conditions is being borne out by the experience of the present season. These notes are written in the middle of February, and up to this time no trace of the disease has been found this season anywhere in the Colony.

This opportunity is taken to mention that Black Rot—in some parts of the world a vine disease much more feared than Plasmopara—was rumoured to have appeared at Constantia and Wellington, in the Western Province, last year. Inspections failed to disclose any foundation for the stories beyond an exceptional prevalence of Anthracnose, called Black Rust by some farmers, and a withering of grapes due apparently to lack of moisture. According to Professor Schönland, however, Black Rot occurs at Grahamstown. He made the determination about three years ago, and had it affirmed by European authority.

9. SAN JOSE SCALE.—Early in October it was reported on apparently reliable authority that the notorious and highly destructive pest of deciduous fruit trees, the San Jose Scale, had become established at Bloemfontein. This pest had hitherto not been suspected in South Africa. The Cape Government at once urged the O.R.C. Department of Agriculture to do all possible to exterminate the insect, and one of the entomological staff was sent to Bloemfontein to assist in ascertaining the extent of the outbreak. Later the writer was able to demonstrate that the insect, though closely allied to the San Jose Scale, was really quite a distinct species of *Aspidiotus*, A meeting of the entomologists of the several colonies was held at Bloemfontein on November 26th, at which this view was accepted, and the O.R.C. Director of Agriculture advised, on the strength of the evidence that had been collected, that no further special action in regard to the insect was necessary. The insect had meanwhile been referred to the scale experts of the United States Department of Agriculture for identification, and they have since reported that it appears to be a hitherto unknown species. Its resemblance to its dangerous relative is very close, particularly on the plants on which it was first found at Bloemfontein.

10. CODLING MOTH PARASITE.—Three native parasites have been reared from Codling Moth larvæ collected in the Cape Peninsula. The most common one has been named by Mr. P. Cameron, an English authority, as *Pimpla heliophila*. Another he calls *Hymenibosmina pomonellæ*. The third is uncommon, and has not been studied. The Pimpla was abundant a few seasons ago, as high as thirty per cent. of some lots of larvæ collected being destroyed by it, but last season it was too scarce to be of material benefit, even in an abandoned orchard under observation where nothing is done that would disturb it. Professor Koebele, an insect collector of international reputation, has told the writer that he has reared six different parasites from the Codling Moth in California, yet in that country it is about as necessary to spray to save apples and pears from the pest as it is in the infested parts of the Cape Colony, and spraying will probably continue to be deemed necessary notwithstanding all the parasites that may be found and introduced. Considerable interest was aroused at the Cape about two years ago over the alleged success of a parasite (*Calliephialtes messer*) introduced into California from Spain by Mr. Geo. Compere. While in America this year the writer enquired about this insect. It breeds very well in confinement, and has been distributed to various parts of the State; but it is exaggeration to say that it has yet proved of any practical value, or that it has given good evidence that it will. Californian newspaper reports last summer stated in glowing terms that it was doing splendid work in the Pajaro Valley, the chief apple-growing district of California. The writer in consequence visited the section. The reports were found to be pure fabrication, and the growers to have little interest in the matter. The extensive orchards were white with arsenate of lead, and more and better spraying is now said to be done than before the parasite was heard of. The orchard in which the first liberations were made over two years before was visited, and from what was said by the owner, it is doubtful if any descendants of the first parasites were ever seen. Other colonies were later introduced. The County Entomologist, Mr. W. H. Volck, who accompanied the writer, regards the parasite as a complete failure in this part of California; but the writer was left with the impression that it had not had a fair chance owing to the excellent condition in which the orchards are kept, and the universality of thorough spraying. The State Horticultural Commissioner, on request, presented him with parasitised Codling Moth larvæ to take to the Cape. Every care which suggested itself to keep these alive on their long journey was exercised, but this attempt to introduce the parasite failed. Subsequently in November, when Mr. Mally was engaged in America to return to the Cape, he was instructed to visit California and secure more material. The first material was brought in the middle of the northern summer, and its failure is ascribed chiefly to this fact. The second lot was brought in the winter, and despite its being inferior in many respects, it has yielded eleven male and four female parasites. At the time of writing, hopes that breeding from this modest colony will be successful are running high. From what is said above, however, it may be inferred that the writer is not sanguine that the introduction of the parasite will obviate the necessity to spray or very materially affect the percentage of infested fruit.

11. RED SCALE PARASITE.—It is said that an introduced parasite is doing good work against the Red Scale in Western Australia. The Entomologist of that Colony, Mr. Geo. Compere, two years ago sent us a box of lemons infested with

scale parasitised with it, but not a single parasite was observed to emerge. Last year we sent scale-infested orange trees over, and requested that they be exposed to the parasite and then returned, and that more fruit be sent. The favours were granted, but unfortunately the trees were kept in a covered boat on deck and were nearly dead and thick with mould on arrival. The fruit, a box of lemons, was carried in a cabin at ordinary temperature (February and March); and from the scale on it was reared a few very small unidentified parasites. These were colonised on two small trees in an orchard. Since then no more parasites have been seen, and it is feared that the work has been futile. A few exit marks of parasites have been found in scales on the trees, but these were probably made by a native parasite. The West Australian Agricultural Department was implored several months ago to send us more material, and it is still hoped that some may come this season, although no reply to our letters have been received. What is understood to be the same parasite was sent to California by Mr. Compere, but it is uncertain that it is established there. Mr. Mally visited a lemon orchard near Los Angeles, where liberations were made, and selected several dozen of the most scaly fruits for bringing to the Cape. The lemons were in good condition on his arrival, and have kept well since, but not a single parasite has appeared. It may be mentioned that this work consumes a great deal of time. Efforts to get the parasite will be continued. It is preferred to get material from Western Australia owing to that country and this being in direct sea connection, and the seasons being the same, but if help is not received from there, arrangements for sendings from California, already in part made, will be completed.

California desires certain parasites of the Black Scale (*Saissetia oleæ*) only known at the Cape. Two good lots of material were forwarded during the year, one being sent by parcel post, and the other taken by the writer as far as England in cool storage, and then expressed. The scarcity of the scale in this country renders the procurance of material a matter of considerable difficulty. Some of the parasites wanted were reared and liberated from the lot the writer took.

12. Miscellaneous Notes. In continuation of tests made in the previous year, peaches heavily infested by living maggots of the Fruit Fly (*Ceratitis capitata*) were placed, on February 20th, in the Cape Town Harbour Board fruit cool chamber, where the temperature ranged about 38° to 40° F. Twelve days later one box was removed and the contained peaches opened; of the 95 maggots found, 90 were dead. On the twenty-first day the contents of two other boxes were examined and the 266 maggots found were every one dead. Two puparia were also found; one had been injured, and the other on being tested, failed to develop. On the twenty-seventh day the contents of two more were examined, and all of the 245 maggots found to be dead, while the only puparium failed to develop. At the same time the remaining peaches, about sixty in number, were placed amongst wood wool in gauze-covered jars, and subsequently were carefully tended; yet not a single fly developed. If the fruit had not been cold stored, upwards of two hundred flies would have been expected. This record is inserted here owing to its interest in connection with the export of fruit.

The utility of the " paraffin " remedy for the Fruit Fly is now under test. It is the outcome of an observation by an orchardist of West Australia, and was brought to notice last April by the Agricultural Department of that Colony. Tins containing oil are suspended in the trees. The flies are attracted and meet their death in the oil. The Eastern Province Entomologist kept two tins in a *Citrus buxifolia* tree in the Botanic Gardens at Grahamstown from early August until the fruit was all off, December 21st. During this time 485 fruit flies were caught, 390 of which were caught in September, October and November that is, at the time of year when the killing has the greatest preventive value. But tests in peach trees near Cape Town have yielded disappointing results, few flies being caught, and the fruit becoming infested. Large numbers of an astonishing variety of other insects, injurious and beneficial, were incidentally destroyed. It is now suspected that the insects mistake the oil for water, and parallel tests of oil and water will be made in confinement. Oil of the common grade, 150° flash test, evaporated only about half as fast as water, but frequent attention is required to keep open tins from drying, particularly during windy weather. Rain is apt to replace the oil with water. Care is required to prevent injury to the trees by overflowing or "creeping" of the oil.

Tobacco Wilt was again the subject of complaint from the Kat River Valley. The Transvaal Plant Pathologist and the E.P. Entomologist visited the section, but the visit threw no new light on the matter. As before the wilting was associated with the mining of the stems by larvæ of the Potato Tuber Moth (*Gelechia operculella*. The growers have not heeded the recommendation to exclude the parent moths from the seed beds as is done in Rhodesia.

The Kafir Corn Aphis was also the subject of special enquiry by the E.P. Entomologist, a report by him on which is embodied in notes on the trouble published in the *Agricultural Journal* for January, 1908. Further attention to the matter is being given.

The Erinose disease of the vine, caused by *Phytoptis vitis*, a mite of microscopic size, has spread widely in western vineyards of late years. Experiments, the details of which will soon be published, were conducted last winter to determine the relative value of likely substances as remedies. The fumigation of cuttings, as for scale insects, with an ounce of cyanide to 150 cubic feet of space, was found fully effective. Dipping the cuttings in a weak solution of a certain proprietary compound also gave surprisingly good results, but this test will be repeated before it is made known publicly. Dipping in paraffin and hot water yielded inferior results.

CHAS. P. LOUNSBURY, B. Sc.,
Government Entomologist.

APPENDIX V.

REPORT OF THE AGRICULTURAL ASSISTANT FOR THE YEAR 1907.

In accordance with instructions, I have the honour to submit a report on the work of my branch for the year 1907, extended as nearly as possible to the date of termination of my tenure of office, outlining conclusions arrived at, but referring you for detail to separate reports.

Funds.—In view of the restricted funds furnished and the necessity for curtailment of expenditure, all lines of work under my charge have necessarily been reduced to an extent materially diminishing both the scope and the efficiency of the operations of the branch. Much that might have been undertaken had to be indefinitely postponed. The experimental research, inquiries, and investigation committed to my care necessarily involve certain outlay, and if this is withheld much of the sums already invested are rendered unproductive. Not to work to full capacity is not to work to full profit, but if funds are not forthcoming there is unfortunately no alternative.

Office.—Office work, as usual, took up much time, the direct correspondence with farmers and others increasing steadily. These letters require individual attention, and frequently considerable reference and inquiry in the preparation of replies. The following figures show the expansion of correspondence, apart from formal and circular communications:—

1906: Letters Received, 2,676. Letters Despatched, 2,078.
1907: Letters Received, 3,062. Letters Despatched, 2,296.

The preparation of reports and papers also occupies much time, while the clerical work connected with the management of the experiment stations is by no means small. The files and records of the Office are in such a condition that there should be no difficulty in following up the work which has been done in the past. In a case of emergency, and in view of his special capabilities for the work and his knowledge of certain parts of the country, I consented to Mr. R. W. Thornton's being temporarily seconded for locust destruction duty on the conclusion of three weeks' leave of absence (B7004/4128).

Travel.—Following the practice of previous years, whenever opportunity served, I have, by farm to farm visits, endeavoured to become acquainted as thoroughly as possible with the circumstances and needs of different sections of the Colony, and to meet farmers representative of the many different rural interests in their own homes, and to discuss with them matters of local importance on the spot. By these means I have acquired experience which is constantly of service in subsequent advisory work. During the year I had occasion to visit the following Divisions:—

Hay.
Herbert.
Beaufort West.
Cradock.
Graaff-Reinet.
Oudtshoorn.
Albany.
King William's Town.
Stockenstroom.
Stutterheim.
Komgha.
East London.
Peddie.
Port Elizabeth.
Uitenhage.
Humansdorp.
Uniondale.
Knysna.
George.
Mossel Bay.
Riversdale.
Swellendam.
Caledon.
Robertson.
Worcester.
Ceres.
Tulbagh.
Malmesbury.
Paarl.
Stellenbosch.
Cape.

About half (180 days) of my time I was engaged away from headquarters at the Experiment Stations or in travelling about the Colony. All movements and duties upon which I have been engaged have been recorded in monthly reports furnished to the Department.

The Longkloof.—In accordance with instructions to furnish a report as to what may be done for the agricultural development of the Longkloof, especially on the proposal to grant facilities for the distribution of Guano to that part, I described to you the conditions found there, and explained that in view of the recent withdrawal of such facilities throughout the Colony it would be invidious to make an exception in favour of any one locality, particularly as the farmers were unable to show whether such special consideration would really induce them to increase the acreage of cereals. They have no idea what good value they get for their money when purchasing Guano, nor of the difference of yield gained by the use of artificial fertilisers. On the other hand, I submitted proposals for the assistance of farmers in this and the adjoining areas of Kamnassie and parts of Humansdorp and Willowmore districts by placing a technical officer in that area, with the object of giving advice and instruction on matters connected with soils, crops, implements, methods of cultivation, manuring, harvesting and preparation for market of all crops grown in the district. I outlined his duties and estimated the cost. The proposal is novel, and admittedly experimental in character, but, I believe, adapted to the peculiar needs and conditions of the Colony, and might with advantage be extended to other localities. For full details I refer you to the report.

South Eastern Districts.—On a similar mission I was directed to make a journey through the divisions of Komgha, East London and Peddie, where I met with peculiar conditions of progress and backwardness in neighbouring localities, and for the advancement of which I made certain recommendations. The fruit, cattle, and sheep industries, deserve especial encouragement, and there is great scope for experiment stations to study the further possibilities of these parts, so richly endowed by nature in soil, rainfall, and climate, with such economic advantages of port and railways as well as industrious but not yet wealthy landowners.

Douglas.—Recently (February, 1908) I had occasion to visit Douglas Irrigation Works in connection with a supposed malady of lucerne. I was struck with the lack of progress since my previous visit in 1903, especially by the fact that there is yet a considerable extent of excellent irrigable soil, of superlative quality, the property of Government, under the furrow, not yet leased or sold. There is ample water for this valuable land, for at present I understand no night water is used by the erf-holders and very little on Sundays, while daily there is a considerable amount returned to the river, lost. Privately owned land up and down the river is being brought under irrigation at considerable cost. In view of the very rich nature of the land, and the expense incurred in rendering it irrigable, the cry for closer settlement and the desirability of introducing an industrious class of farmer on to this potentially rich area, I venture to recommend the early sale of the land still in the hands of the Government. The blocks should be about fifteen to twenty morgen, not small erven like those at first given out.

Lectures.—In August I was privileged to deliver a short series of lectures on agricultural topics at Grahamstown as part of the Vacation Courses instituted by the Rhodes University. The attendance and interest shown was most gratifying to the promoters of the movement. Such courses, if continued, are calculated to be of the greatest benefit to agriculture in South Africa, as a particularly desirable class—young men, actually farming—are reached, who, while desirous of acquiring knowledge, have not time to spare for longer courses. The time allotted for Agriculture, *par excellence*, was quite too little, out of proportion to that given to allied but ancillary subjects. It is to be hoped that the courses will be continued, and that a due share of time will be given to the relatively more important sciences, those with a practical bearing on farm operations. The subject matter of the lectures given was published in the *Agricultural Journal* at a later date.

In addition to these lectures at Rhodes College, I addressed meetings at Cradock (December, 1907), Komgha (January, 1908), and Graaff-Reinet (January 17, 1908), and attended Agricultural Shows and Farmers' Association meetings wherever possible.

Closer Settlement.—The question of closer settlement, so prominent in other parts of the world, is now beginning to take hold of public attention here. Without State interference there is a tendency in certain parts towards sub-division of land and the intensive cultivation of small areas, noticeably in the vicinity of our larger consuming centres and in irrigable areas. The process is gradual, yet in looking back over the past five years marked progress in this direction can be observed, in proof of which it is only necessary to point to the advance made on the Cape Flats from Belleville northwards and eastwards, on the Strathsomers Estate, on the Sundays River, and in the Dutch Reformed Church Labour Colony at Kakamas. The land best able to carry a dense population and to support families on small holdings is irrigable ground with fairly constant water, such as might be found on the Touws, on Gamtoos and Gouritz Rivers. Farms dependant upon rain cannot be broken up advantageously into very small parcels of land, but there are none the less wide stretches of country in the hands of single owners today which from the national economic standpoint would be more advantageously occupied by a number of relatively poorer farmers producing in the aggregate very much more off the same piece of land. It would be well if the experience of other countries with regard to Closer Settlement schemes could be made available to this Colony and public opinion guided aright from the outset. Two things may fairly be assumed: (1) That any such schemes adopted in Cape Colony will possess points quite distinct from those of other countries, and (2) that the chief desideratum in persons charged with the work of carrying out any schemes brought forward is an intimate knowledge of this country, its peculiar circumstances and its people. This is of the first importance and of greater value than experience of closer settlement schemes in foreign countries.

Poor Whites.—In the course of my work the urgency of the problem of the growing indigent white population has repeatedly been brought home to me. The fatuous content and the inherent unreliability of this class renders difficult the task of improving their condition. Philanthropic bodies such as the Church use drastic coercive measures with good effect, but Government in all its varied guises they seem to regard as an institution for their support and fair game at all times. In irrigation schemes, in forest management, in land settlement and in relief works of an agricultural character, it would seem best to leave the confirmed poor white to the public charity. The State may then concentrate its endeavours upon those who, though not yet destitute, are tending towards this degraded state and who have still some farming aptitude, independence and energy left, but who lack sufficient means to embark unassisted on the risks of a farming venture. Prevention in this case is as worthy as cure, and rather more likely to be successful. These opinions underlie my remarks on Douglas and my separate report on Touws River Scheme.

Co-operative Experiments.—Seed Distribution.—The distribution of packets of seed to farmers of sorts deemed worthy of trial in the Colony has now been in progress for five years. This enterprise has been attended with much success, aiding farmers in a direction which appeals very directly to them and in a way in which they are not in a position to help themselves. The method of instruction by direct demonstration and personal dealings with each individual is much more effective in Cape Colony than that of diffuse distribution of publications. Our farmers have a greater aptitude for observing actual facts than for reading, and the thing seen and word spoken appeal more to them than any amount of literature. The introduction of better varieties of crops and of new crops is a self-evident advantage which needs no elaboration to justify. The work is essentially experimental; there is uncertainty as to whether the crop will suit the soil and climate, and the proper mode of treatment is not always comprehended, although directions for sowing are issued wherever necessary. There is no doubt that in a large measure owing to this distribution of seed for trial and the publication of results giving the names of the actual experimenters, more attention is being paid to the possibilities of growing new crops. Merchants are stocking seed not previously thought of, notably grasses, millets, rape, kale, mealies, wheats, turnips and mangels. The spread of paspalum grass is specially noteworthy. Of this species alone 798 packets have been sent out by the Department since the initiation of this work. Cocksfoot, fescues, rescue, rye, and tall oat grasses also promise well, and are calculated to exert a material influence on our methods of farming during the next few years. Gluyas, Darling, and other wheats have been brought into prominence. Rape, mangels and the like have long been known in some localities, but have been shown to be capable of profitable cultivation over much wider areas. Other crops, such as cotton, castor oil, flax, etc., are being tried, and the results from time to time made known. Full reports are published for general information in the *Agricultural Journal* from time to time, a list of which will be found included in Appendix I.

In the accompanying statement it will be noticed that the list of varieties under trial this year, the number of farmers to whom seed was sent, and the number of parcels despatched is less than last season.

	1903.	1904.	1905.	1906.	1907.
Number of Sorts of Seed under Trial ...	17	45	63	151	123
Number of Farmers Co-operating ...	59	215	505	1,491	1,112
Number of Parcels Issued	76	313	2,808	4,492	4,003

The applications for seed were actually more than ever, but twice during the year (Memos. B.3097/T.56 and B.7478/U9) distribution had to be suspended on account of exhaustion of funds. This irregularity was largely due to action taken in view of Minute No. B.5059/M8. The amount asked for was not placed on the Estimates. These interruptions to the work of seed distribution are very unfortunate. Applicants are disappointed, receive a bad impression, and lose interest in experiments which might otherwise be of material benefit to them. The continuity of the experiments is broken, and much of the value of past trials is lost. Success at one centre leads to many applications from that locality. Supplies are stopped, and the interest is destroyed. In the present instance this is the more vexing as an ample stock of seed is on hand at the store at Robertson, only the question of railway carriage prevents distribution. My suggestion for reduced, or nominal, rates over Government lines has not been entertained, although the ultimate result of increasing the crops of the country is also obviously to increase the railway business. It is trusted that adequate provision will be made for the continuance of this promising work. The amount required depends on the demand, but this can be relied upon to increase rapidly if a constant supply is kept up, and reports judiciously published in due season.

Co-operative Manurial Experiments.—The reports of the manurial experiments of the year carried on in conjunction with farmers in different parts of the Colony have been received, and will be dealt with at an early date. Mr. Thornton, my Assistant, was charged with the duty of supervising these experiments. Owing to his prolonged absence already referred to, this matter has been unavoidably delayed.

Experiment Stations.—In view of instructions to exercise rigid economy, the expenditure at both Experiment Stations has been kept at a minimum, as the following figures show:

	Robertson.	Knysna.
Sum allocated for the year 1907-8	£1,310	£1,190
Amount authorised for 9 months	873·33	793·33
Expenditure for 9 months	775·90	591·16
Saving	£97·43	£202·17

From this it will be seen that considerably less has been expended than was originally intended, but of course there has been a correspondingly reduced amount of investigation carried out, for without adequate funds research cannot be actively prosecuted. Indeed, since certain charges, rental, salaries, and livestock expenses, etc., remain unaffected, the actual cost of the work performed is higher owing to the regrettable necessity for restricting expenditure and postponing desirable experimental enquiries. Both establishments are now fairly well equipped, and are carrying out the objects for which they were intended, the investigation of problems connected with agriculture, with a view of increasing the profitableness of farming by improving present methods, testing new crops, processes and materials, and demonstrating the results to the farming public. For full particulars as to the aims and objects of agricultural experiment stations, I would refer you to my Annual Report for 1902, in which the question is discussed at length, and a policy formultaed which I have been following ever since. The unfortunate financial position of the country precludes the extension of the scheme for the present, but I would take this, my last opportunity, to commend the matter to your sympathetic attention. I am convinced that the slow but sure methods of experimental science applied to agriculture are the soundest foundation on which to base the future of agricultural education in this Colony. Before ever instruction can be imparted, it is essential to learn the fundamental laws to possess something other than mere empiric information, and to be able to give satisfying explanations of known facts. We have by no means reached completeness as regards our knowledge on these subjects, rather we are just at the threshold, we sadly lack light to penetrate further into the mysteries of the first of arts. Agricultural education is a popular cry at the moment, and one to be encouraged in every way; yet most of our material for instruction is drawn from over-sea sources.

The aim of the Experiment Stations then must be, not only to instruct and aid farmers in the localities they serve, but also to furnish reliable facts on which our agricultural instructors can base their teachings. The information gained is to be disseminated by written reports, by lecture, and by demonstration. A commencement in each of these directions has been made, and each has been found feasible and useful. Mr. Visser, at Robertson, has lectured on results obtained in tobacco culture, and has been asked to deliver further addresses. An exhibit of the work of that station was made at Robertson Agricultural Show, and received much attention. Only lack of means prevented the repetition of this exhibit elsewhere. The reports which have been submitted on the work of the Experiment Stations during the year have been published in the pages of the "Agricultural Journal" for September, October, November, and December, 1907, and will be found detailed in Appendix II.; others are in course of preparation, and will be published in due course.

The Experiment Stations established so far have, I hold, justified their existence. The first seasons are naturally the least instructive for the value of all such research, and observation increases with time. In continuing the work, and in establishing new stations, the experience gained in these, the first in Cape Colony, will no doubt prove useful. The most arduous task is now completed; and I look forward to a period of useful activity and progress for the Agricultural Experiment Stations. Before turning to another topic I desire to place on record my entire satisfaction and appreciation of the services of the managers, Mr. K. Meldal Johnsen at Knysna and Mr. E. A. Visser at Robertson. The Department is fortunate in the possession of two such competent and reliable officers, both thoroughly conversant with their somewhat peculiar work, enthusiastic therein and well able to demonstrate the results to inquirers, a very necessary qualification.

Fertilisers, Farm Foods, Seed and Pest Remedies Act.—During last session of Parliament an Act to control the quality of fertilisers, farm foods, seeds and pests remedies, was carried through without opposition. When put in operation the farmer will be protected against fraud in a direction from which he has hitherto had no security. Manufacturers and importers will, in terms of the new law, have to register under brands the fertilisers, etc., they put on the market, guaranteeing to the authorities the composition. This will be checked by analyses, samples being taken at any place or time. The farmer to whom for the most part chemical terms are gibberish, can rely upon it that proper precautions are taken to control the composition of fertilisers, etc., whilst the honest dealer is also protected from unscrupulous competitors. It remains now to enforce the Act and to educate public opinion to take the fullest possible advantage of its provisions.

Turkish Tobacco.—The results of experiments at French Hoek on the growth and curing of Turkish tobacco were so very promising that it was decided to extend the trials so as to ascertain, as far as possible, the geographic limits within which this variety may be grown, and at the same time to instruct farmers who had expressed a desire to that effect in the peculiar processes of curing the leaf. The industry may be regarded as now established at French Hoek, from which every season a certain supply of the leaf may be expected, although no doubt there is still room for improvement in quality and preparation. Time will not permit me to see the conclusion of this year's experiments, but already this much may be said that whereas every attention was paid by the experimenters to the crop, yet failures have occurred at the more eastern centres, while elsewhere Turkish tobacco has done well. It seems reasonable to attribute the cause to local, not personal circumstances. This conclusion limits the area of profitable culture of the crop. By these experiments a further number of farmers have been instructed in the processes, and intend next year to go in for it on a large scale. Mr. Stella has been most assiduous in the work, the success of which is in great measure due to his exertions and skill.

Prickly Pear.—The experiments initiated last year, as the outcome of recommendations made by a Select Committee of the House of Assembly on Prickly Pears, were brought to a conclusion. The Report thereon was published in the *Agricultural Journal*, and was also issued as a separate pamphlet. As full details are there given, suffice it here to say that a conclusive test was made, and that Arsenite of Soda, the scrub exterminator supplied hitherto by Government, has been shown unquestionably to be the best as well as the cheapest remedy. Variations in the mode of application were also tried and gave rise to several new recommendations, all fully detailed in the report referred to.

Jointed Cactus.—A series of experiments to ascertain the best means of exterminating that insidious pest, the jointed cactus, were conducted at Uitenhage under the direct charge of my Assistant, and with the kind co-operation of the Municipal authorities of Uitenhage. Various proprietary preparations were given a thorough trial, and the ultimate conclusion is clearly in favour of a 5 per cent. solution of Arsenite of Soda, on the score both of cheapness and efficacy. This is the more fortunate, since this is the same preparation as is recommended by the Department for Prickly Pear, for locust destruction and for cattle dip. A full report in a form suitable for publication, and to issue as a leaflet, was submitted and appeared in the *Agricultural Journal* for March, 1908.

Fibres.—A growing interest has been manifested this year in the possibilities of growing fibre crops such as cotton, flax, hemp, ramie, bush-rose, etc. Experiments in this direction have been in progress for several seasons, and while it is not yet possible to give reliable information as to precise regions, yield, cost of production, and value, it may be said that both cotton and flax have undoubted possibilities; the others are more doubtful. Cotton attracted much public attention, and many applications were made for seed from districts which were quite unsuited to the crop. Seeing is believing, so as far as possible these requests were acceded to so as to demonstrate both its suitability to some parts and unsuitability elsewhere. Good cotton has been grown at many points in our warmer parts, chiefly in the south-eastern coastal region, and there seems reason to anticipate that the cultivation of this crop will soon be placed on a commercial scale. Reports on samples sent to England are highly encouraging, and there seems every reason to expect that similar cotton can be produced in large amounts. Good samples have also been received from the neighbourhood of Vryburg. The matter is not being allowed to drop, and much interest is being shown in it, chiefly in the Transkei and Border districts. Several farmers in the Western Province are now growing flax on a field scale, and experiment has shown that it grows well throughout the areas of fair rainfall. It is valued at present chiefly for the linseed, and it is questionable whether the fibre can be advantageously extracted. The main difficulty in both these instances is the labour, more or less skilled, which is required, and in the case of flax, the water. The other possible fibre crops are more doubtful at the present time, and certainly we are not yet in a position to recommend them with any confidence.

Castor Oil.—The possibility of growing castor oil profitably has frequently been raised, and as a result of enquiries made, a recommendation was submitted (19th June, 1907) whereby it was hoped to accumulate at a minimum cost sufficient quantity of beans to justify the erection of plant for expressing oil, either by Government or by private enterprise. The plan postponed would also serve to call public attention to the common occurrence of the plant throughout the Colony, and supplies would soon indicate the regions specially adapted to its growth, in which the culture of castor oil might be further extended. I understand that further steps are being taken in the matter.

Statistics.—In every Annual Report since 1903 I have called attention to the lamentable absence of accurate and systematically collected agricultural statistics. Without reliable returns the Government is not in a position to gauge such elementary and essential facts as the ability or otherwise of the country to feed itself, the rate of progress of different branches of rural industry and the relative importance of these. This prevents interchange of products from one part of the country to another, to the advantage of each. Unfortunately the figures we have are in great measure inaccurate and misleading. To repeat what I have previously stated:

"I have had occasion during the year to call attention to the highly unsatisfactory condition of our statistical returns on agricultural matters. Important enquiries have been made of this Branch from merchants seeking opportunities to buy, or for an outlet for their wares, from persons desirous of taking up new productive industries, from politicians, journalists, and others interested in the welfare and progress of the Colony, and also from the Admiralty, anxious to know to what extent we could supply our own wants in time of need. To all these it has been possible only to give indefinite replies,—general impressions, instead of plain statements and clear cut and dried facts. In this respect our position in comparison to other agricultural countries is far from satisfactory or creditable. In a Colony such as this, in which the economic conditions are so rapidly changing, it is of the utmost importance that figures be preserved showing our state at different periods, especially as regards rural forms of wealth and the food supply producable, but unless such data are accurate and entire, they become less than worthless, positively misleading. I call special attention to this point, as I have had occasion to feel our wants in this respect very severely."—Annual Report, 1905.

Botanist.—In previous annual reports I had pointed out the great need of a trained botanist to the Department of Agriculture; it was therefore a matter of great satisfaction to me when the services of Miss Treleaven, previously of the Government Herbarium, were made available for this Branch on 17th October, 1907. Since that date her time has been fully occupied with the duties of an economic botanist. Plants and specimens of economic importance which have been gathered together as opportunity served, have now been properly mounted, named and recorded, and duplicates for purposes of demonstration specially prepared. This is now a collection of some considerable value, embracing as it does a herbarium of colonial and foreign crop plants, grasses, edible herbs, plants poisonous or reputedly so, weeds, parasitic plants and plants of possible commercial or industrial value. The economic herbarium already numbers 200 specimens. A commencement has been made which, if actively continued, will be of great value for reference purposes. Through correspondence and the co--operation of the Managers of the Experiment Stations, my assistants and myself, specimens of interest are constantly being added. Similarly, for some years past, opportunities have been taken of collecting samples of colonial produce, wheat, oats, barley, rye, mealies, Kafir corn, beans, peas, lentils, lucerne seed, cotton, grass seed, bush teas, etc., which are constantly of use for purposes of identification and comparison. A special collection of weed seeds required in the examination of samples of seed submitted for report as to purity has also been catalogued and arranged. In addition to this work, Miss Treleaven has given some time to preparing replies to numerous enquiries on botanical questions, particularly with regard to names, and uses or value of specimens sent, while her services have also been made use of by the Director, the Chief Veterinary Surgeon, the Editor, the Entomologist and the Senior Analyst. It was my intention that Miss Treleaven should acquire some knowledge and practice in the art of seed-testing, in view of the promulgation of the Fertilisers, Farm Foods, Seeds and Pest Remedies Act. Though nominally transferred to this Branch as from 1st July, she did not actually join until 17th October, just when I was absent up-country on a prolonged tour.

Resignation.—On the 16th December I found myself constrained on professional grounds to intimate to the then Minister that I did not purpose to seek renewal of my current agreement with the Government.

Staff.—At a time when I am relinquishing my Office, it may be permitted me to express my thanks to those who have been most closely associated with me. I have been most fortunate in the personnel of my Branch, who have one and all taken a lively and intelligent interest in the work allotted to them, thereby lightening the task to everyone. Without reservation, I can commend each as fully conversant with the duties of their several offices, and I desire to record here my high appreciation of their services and abilities, and, above all, of the willing spirit which has animated all their actions.

Acknowledgments.—I desire to take this opportunity, in my last public report, of expressing my appreciation and offering my thanks to all with whom I have come in contact in the course of my work, farmers, merchants, officials and especially perhaps to secretaries of Farmers' Associations and Agricultural Societies, for sympathetic encouragement and practical aid which has repeatedly rendered easy tasks which without such timely help would have been beyond my power. Constantly travelling, it has been my good fortune to come in close, if brief, personal relationship with thousands of farmers, at first as an utter stranger, and there is no remembrance of anything throughout six years' service but the greatest courtesy and kindest hospitality beyond all praise and from all classes of the community. These happy memories cannot be effaced, and will remain with me in time to come, a treasured possession wherever my lot may be cast.

ERIC A. NOBBS,
Agricultural Assistant.

Appendix VI.

REPORT OF THE PRINCIPAL, AGRICULTURAL COLLEGE, ELSENBERG, FOR THE YEAR 1907.

I have the honour to present my annual report for the year 1907.

During the year a few changes of staff were rendered necessary in the interests both of efficiency and economy. All the vacancies have not yet been filled up, but the important post of Vice-Principal was given to the strongest candidate who had applied for the Principalship, advertised subsequent to my resignation tendered in June. The gentleman selected was Mr. W. Allan, M.A., B.Sc., Senior Assistant in the County Work Department of the Edinburgh and East of Scotland College of Agriculture, whose practical training in farming, academic qualifications, and experience in diadactic work fully justified the selection.

It is gratifying to note that parents and students have now come to realise the advantage of having a fixed academic year, which, as was previously pointed out, ensures greater value to the student and greater efficiency in the work of the Institution. The number of students enrolled during the year was 44, only one of whom was irregular, *i.e.*, receiving instruction in Practical work only, and admitted subject to beginning the full normal course in January, 1908. For lack of accommodation we were unable to entertain the applications of several who wished to enrol as students, and unless another College is established in the East at an early date the question of increased accommodation at Elsenburg must be faced forthwith, as we are at present quite unable to cope with the number of applicants coming forward. This matter assumes a graver aspect when we bear in mind that of the total enrolments last year, only one was an oversea student, all the rest being South African, distributed as follows: 17 from the Western Province, 21 from the Eastern and 5 from the Transvaal and O.R.C.

A simple and obvious method of reducing the applicants would be to advance the standard of elementary education required for admission, but I do not consider this necessary just yet, as I still adhere to the opinion formerly expressed, namely, that students who have passed Standard VII., though not capable of becoming Instructors in Agricultural matters, are nevertheless, *caeteris paribus*, quite able to become intelligent farmers, to turn out which, must for some time remain the chief object of Elsenburg or any similar institution.

For the Scholarship for advanced study abroad, open to students who have previously passed the Matriculation examination and obtained a First Class Diploma at the Institution, the competition was exceedingly keen, and as will be seen from the appended list, two were granted instead of one promised.

The award of class prizes in 1906 had a most excellent effect on the work of the students during 1907, and for the prize money I beg most heartily to acknowledge indebtedness to the Cape Town firms with whom the institution has business transactions. Special thanks are due to Mr. R. Stuart Solomon, whose enthusiasm for South African agriculture prompted him to award a Scholarship of the annual value of £22 10s., to the Dux of the Junior Class each year, whether he acquired financial aid or not (such necessity being a qualification for bursary holders under the Government scheme). The most profound thanks of agriculturists are due to Mr. Solomon for his public-spirited generosity, and I am specially grateful, as this is the first public manifestation of faith in Agriculture which has come the way of an institution like Elsenburg. Without being beggarly, I hope it is not the last, as I find that students are much more anxious to secure this trophy than more valuable ones pecuniarily, when donated by Government. The Solomon Scholar of 1906 succeeded in 1907 in carrying off the Gold Medal graciously presented by His Excellency the Governor for the Dux of the College. As in 1906 so this year silver medals had to be awarded to two who were first equal in all subjects in the Junior Class. One was kindly presented by the Hon. the Minister for Agriculture, Col. C. P. Crewe, and the other by Mr. R. Stuart Solomon.

Appended is the prize list:—

Prize List.

Dux of College (Gold Medal): G. W. Marshall, Queenstown.

Scholarship for Study Abroad: 1st, G. B. McMillan, Cape Town; 2nd, E. N. S. Warren, East London.

First Class Diplomas: G. W. Marshall, J. C. Masson, Vryburg; G. B. McMillan, E. N. S. Warren, and C. C. Mottram, Klipplaat.

2nd Class Diplomas: E. H. Williams, Cape Town; R. W. M. Morris, Knysna.

College Certificates: G. S. Bell, Johannesburg; V. G. Zahn, French Hoek.

Class Prizes.

Agriculture and Stock: 1st, G. W. Marshall; 2nd, J. C. Masson.

Viticulture: 1st, G. W. Marshall; 2nd (equal), G. B. McMillan and J. C. Masson.

Agricultural Chemistry: 1st, E. N. S. Warren; 2nd (equal), G. B .McMillan and G. W. Marshall.

Veterinary Science: 1st, J. C. Masson; 2nd, G. W. Marshall.

Dairying and Poultry: 1st, G. W. Marshall; 2nd, J. C. Masson.

Practical Dairying: 1st, C. C. Mottram.

Agricultural Botany: 1st, C. C. Mottram; 2nd, G. B. McMillan.

Best Botanical Collection: 1st (equal), E. N. S. Warren and G. W. Marshall.

Agricultural Engineering: 1st, G. W. Marshall.

Woodwork and Blacksmithing: 1st, G. W. Marshall; 2nd, C. C. Mottram.

Juniors:

Medallists: S. Butler, Cape Town, and J. G. Bailey, Cape Town.

Solomon Scholar: J. G. Bailey.

Agriculture: 1st (equal), J. G. Bailey and S. Butler; 3rd, G. Schmolke, Clanwilliam.

Chemistry: 1st, S. Butler; 2nd, R. Whuye, Port Elizabeth; 3rd, J. G. Bailey.

Veterinary Science: 1st, J. G. Bailey; 2nd, S. Butler; 3rd, G. Schmolke.

Botany: 1st, J. G. Bailey; 2nd, S. Butler; 3rd, R. Whyte.

Fruit Culture: 1st, S. Butler; 2nd, J. G. Bailey; 3rd, W. B. Mills, Cape Town.

Entomology: 1st, J. G. Bailey; 2nd, S. Butler.

Woodwork and Blacksmithing: 1st, J. G. Bailey; 2nd, S. Butler; 3rd, W. A. Currie, Grahamstown.

The ordinary work of the farm was carried out on a greater scale than heretofore, and was successful. Separate reports hereon appear from time to time in the *Agricultural Journal.*

Experiments were conducted as in former years, the result of which are being carefully noted for future guidance.

The operations in the Analytical Laboratory and in Viticulture and Horticulture are covered by the reports appended hereto.

J. NOBLE JACK,
Principal.

DEPARTMENT OF CHEMISTRY.

THE PRINCIPAL, Elsenburg College.

I beg to submit my annual report for the year 1907

During the year my duties as Lecturer in Chemistry and Botany at this College have, as in previous years, afforded me little opportunity for doing extensive investigations of a private nature.

At the time my report for 1906 was drawn up an investigation was proceeding with a view to ascertaining the quality of milk yielded by the following breeds of cows in the Elsenburg herd:- Friesland, Jersey, Shorthorn, Ayrshire and also a number of Cape cows. Over 600 samples of milk were examined; the cows being milked twice daily at intervals of 14 hours and 10 hours respectively, the milking being performed by students, many of whom were inexperienced milkers; the most notable fact gleaned was the relatively large number of samples found to contain less than the regulation 3 per cent. Fat, more especially after the longer interval; a report of this work appeared in the March, 1907, issue of the *Agricultural Journal*, so it is unnecessary to again give the various details relating thereto.

In connection with the Oat-hay Manurial Experiments, analyses were as usual made of all the fertilisers used, all were found to satisfy the guarantee: the only material yielding results of particular interest was a sample of Slaked-lime (prepared from limestone) submitted from the District of Hermon, C.C., this sample was characterised by a much higher degree of purity than is usually found in such materials. I have examined "so called" Slaked-lime containing as much as 29·24 per cent. Silica (sand), the Hermon sample only contained 2·27 per cent. of this undesirable ingredient.

Analyses of the soil, on which Oat-hay Manurial Experiments have been conducted since 1905, have been made with the object of obtaining correlative information between the analysis of soils and their manurial requirements, a very considerable amount of work is entailed therein involving the execution of a large number of analyses; it is undesirable to furnish a report of this work until I have obtained further confirmatory evidence on which to base reliable conclusions.

GEORGE N. BLACKSHAW, B.Sc.

DEPARTMENT OF HORTICULTURE AND VITICULTURE.

THE PRINCIPAL, Elsenburg College.

I beg to report that the work done in my Departments during 1907 consists of:

(1) *Vineyards.*—The usual ploughings and cultivations have been carried out in a satisfactory manner. The ground is in good tilth, and the maximum of moisture has been conserved. Consequently the vines are looking very well, and the crops as regards quantity, freedom from disease and general perfection is all that can be desired. Pruning, suckering and disbudding have all been carried out in good time. Those varieties subject to Anthracnosis have been winter dressed with Sulph. of Iron and Sulph. Acid, and some again given a treatment with Bordeaux, which has kept the disease well in check, a few spots here and there only being noticeable. As for Oïdium, the sulphurings given have left no trace of the disease. During November, parts of the vineyard known as the "Oak Bush" were attacked by white ants, which at one time promised to do serious damage, the green parts of the vine being completely eaten off. Energetic treatments with Bisulphite of Carbon injected into the soil in the vicinity of the roots, and an application of vaporite stamped out the pest. Misses throughout the vineyard have been replanted. Grafting of various varieties on different resistant stocks has, as usual, been carried out by the students, resulting in a very fair percentage of strikes. Working on the good results obtained from last year's experiments, the whole of the Stein and part of the White French in the Remount Vineyard have been tied up. The principal advantages obtained are that there is less burning of the grapes, and they remain longer at that stage in which the acids and sugar are well balanced, thus giving a better opportunity of making a better wine with a finer bouquet, and doing away with the necessity of raising the acidity of the must by artificial means. The whole vineyard (with the exception of one plot of about 6,000 vines, which is being treated as an experiment) has had a dressing of artificial manures.

Something over 90 leaguers of wine of very good quality has been made; slightly more red than white. As an experiment, five leaguers of white wine were made from Hermitage grapes. This has turned out an excellent wine, quite free from any bad tinge, and is considered by those who claim to know, quite as good as that made from the white grapes.

(2) *In the Orchard.*—Ploughing, cultivation, spraying, etc., for pests and diseases has been carried out in good time, and in an efficient manner, with the result that the crop is well grown and clean. A number of trees of wild and unsuitable varieties have been grafted over, and without exception every graft has taken. A dressing of stable manure has been given to about two-thirds of the orchard; the remainder is to be done this coming season. A further 10,000 feet of drainage has been done in the lower part of the orchard, 6 in. 4 in. and 3 in. tiles being used. This practically reclaims some of our best soil.

The experiments in Citrus stocks formerly carried out by Mr. P. Cillie under the supervision of the Department, has been transferred from Welilngton to Elsenberg. A piece of ground was suitably prepared, and 208 citrus trees of about 20 different sorts on five different varieties of stocks have been planted. Although the season was rather unfavourable, and some of the trees were poor, only four have actually died. The rest are going on quite satisfactorily.

(3) In the Nursery, work of a general and experimental nature has been carried out by the students.

Throughout as much work as possible in these departments has been done by the students attending to these various operations, together with the course of lectures to students on Fruit Culture, Viticulture and Wine-making, besides some outside work of which I enclose a summary, has occupied all my time during the year 1907.

Extra College Work.—In reference to this work, I beg to report that during the year I lectured to Worcester Farmers' Association at Worcester on American resistant vines, pruning, diseases of vines and their treatment, etc., etc. During the vacation, as one of a Commission, the other members being local men, I visited the districts of Tulbagh, Worcester, Over Hex, Robertson, and Montagu, and reported on the American resistant vines there, besides specially visiting Goudini on two separate occasions, to report on causes of vines dying in some of the vineyards. At request of Director of Co-operation, I inspected and valued fustage on farms to be taken over by Drostdy Winery, also fustage for Paarl Winery. Acted as judge for fustage pumps and machinery, etc., at Rosebank Show. Also in Orchards Competition for "Jagger Cup" for Paarl Farmers' Association. During first part of present vacation inspected Constantia area and a number of vineyards as far as Humansdorp for Plasmopara viticola, of which work I supplied report to Director of Agriculture. This, with visiting a number of local vineyards and supplying correspondents with information in reference to viticulture and wine making, about completes the outside work done by me in 1907.

I. TRIBOLET,
Lecturer in Viticulture and Horticulture.

APPENDIX VII.

REPORT OF THE MANAGER, GOVERNMENT WINE FARM, GROOT CONSTANTIA, FOR THE YEAR 1907.

The management of Groot Constantia during the past year has mainly been in the direction of making the Estate self supporting as far as possible. Experimental work could consequently only be carried on to a very limited extent, owing to the absence of funds, and the implied necessity for drastic economy.

VINTAGE, 1907.—Expectations of an all round good Vintage, as expressed in the 1906 report, were not realised, owing to unfavourable weather conditions prevailing during the gathering period, causing the grapes to decay. The year cannot be quoted as a good one, and uneven wines of less than normal alcoholic strength formed a portion of the Vintage.

The amount of wine produced was 21,468 gallons, or 169 leaguers, an excess of 4,123 gallons over the 1906 crop.

Pressing commenced on the 5th March in favourable weather, which however did not continue to the end. The majority of the crop was however gathered before the wet weather set in. On the 17th March 2·10 inches of rain were registered during 24 hours, and this brought about a rapid decay of grapes, particularly the trellised Hermitage, which rotted with only from 15 to 16 per cent. of sugar. To prevent further loss, these were pressed, and the resulting watery composition, amounting to about 3,503 gallons was, as soon as fermentation had ceased, submitted to distillation, as were also the other wines of low alcoholic strength.

The 1907 wines retained have so far passed through a normal evolution, and possess the necessary qualities required of wines for maturation. Some of the Hermitage lacks colour, but possesses other good qualities, making it most suitable for blending. This lack of colouring matter cannot wholly be attributed to cultural defects, but also to the cool fermentation brought about by the use of cement tanks. The effects of temperature upon the extraction of colouring matter is a most important factor, and experiments have proved that the maximum of colouring matter is produced by the effects of high temperature, the question therefore arises, whether it is advisable to adopt methods suitable to hotter climates than ours. Experience gained here during the last two Vintages has brought home the convincing facts that the adoption of cement tanks in these parts would be swinging the pendulum to the other extreme, and that in our desire to bring about perfect conditions of temperature for fermentation we are overstepping the medium course.

In order to create a suitable medium for fermentation in the first must that was pressed, it was found necessary to raise the temperature by passing hot water through a coil suspended in the must.

During the 1906 Vintage a quantity of must became putrid in one of the tanks after four days, owing to the low prevailing temperature bringing about an unsuitable medium for the germination of the yeast.

All the 1906 White Wines made in the cement tanks failed in quality in spite of otherwise most favourable conditions, while that made this year, and not fermented in the tanks, is of good quality.

The cement tanks, which are constructed of brick and cement, are no acquisition, nor can a guarantee be given for their maintenance. Some of them show signs of cracking, and consequently are dangerous to use.

The re-adoption of fermenting "Kuips" in conjunction with attemperators, in case of necessity, is strongly to be recommended. This would greatly enhance the equipment for wine making.

The Aero-Turbine Machine, described in my previous report, has one very serious defect, which it is intended to have remedied for the coming Vintage. It has no aperture which would provide a means for cleaning out the machine after usage. Some eight baskets of decomposed grape husks, stalks, etc., were removed from this machine, which it had retained from the previous Vintage.

Further experiments were carried out with the Shiraz and Mataro from Tokai. The grapes were pressed in April and, in spite of the rains, showed no signs of decay. The resulting wine is rich in colour and body, but lacks fruit acid, and is therefore somewhat flat and slightly harsh. This wine was exhibited for exhibition only at the last Wine Show, and received adverse criticism from the Judges. Many farmers and wine experts from Cape Town houses were, however, highly impressed with the properties of the wine, and I have no hesitation in recommending these varieties in question as the most suitable for blending with Hermitage, as now produced from American stocks, whereby the properties lacking in each will be restored.

If we are to look to export, and to suit the English palate, then it is time we sift principles from prejudices, and gather from experience in other countries that which is of value to us, that we may arrive at facts which are of importance and so get beyond the stage of groping in darkness.

Of the inferior wines, most have been got rid of, over 300 leaguers having been sold. The remaining stocks of this type, still on hand, owing to there being no market, have been analysed from time to time in order to ascertain any increase in their volatile content, and, wherever signs of further deterioration have set in, distillation has been resorted to.

There still remain some 135 leaguers for distillation, which is being proceeded with.

The best of the wines were blended and sold in case.

The fustage is in good condition, in most cases having been steamed or given other effective treatment.

Sale of Wine. - Since the reduction of prices as recommended in my previous report, the sale of bottled wines has greatly improved. Some sweet Constantia has also been put on the market, which meets with a moderate sale.

Vineyards.—The coming crop promises quantity, and the next Vintage will exceed last year's yield, several new blocks of Cabernet having come into bearing. Weather conditions are, however, very adverse, and battling Oidium and Anthracnose, jointly with weeds and Calandra, has been incessant. In view of these conditions, no forecast can be made as to quality. The continual use of fungicides has proved successful, and though traces of disease may be found, the Vineyards are in good condition. Blocks which two years ago were black with Anthracnose are now almost clean. Both winter and summer spraying was done

For the information of those who still maintain that swabbing is the more economical method, both as regards time and material, the following experiment will be of value:—

Spraying and Swabbing Trellised Vines. Labourer A. sprayed 112 trellised vines with 2¾ gallons solution in 16 minutes. Labourer A. swabbed 82 trellised vines with 2¾ gallons solution in 32 minutes. The same quantity of spray did 30 vines more in half the time.

Spraying and Swabbing Bushed Vines.—Labourer A. sprayed 46 bushed vines in 13 minutes, using 2½ gallons. Labourer A. swabbed 29 bushed vines in 31 minutes, using 2½ gallons solution. Same quantity solution sprayed did 17 vines more in about two-fifths the time.

An additional block, consisting of 200 White Hanepoot grafted on Hybrid 1202 has been added as an experiment.

A row of White Hanepoot on 1202 has been planted in the midst of a Phylloxerated block of Hanepoot in order to test the Hybrid's resistance.

A sample of locally prepared sulphur was received from the De Beers Explosives Works for experimental purposes. An analysis revealed a moisture content 3·4, which caused the particles to cling, otherwise it is sufficiently pure. It is being applied to a block of vines set aside for the purpose, and has so far successfully checked Oidium. This sulphur can be obtained at a very much lower rate than other brands.

American Vines. - In connection with these, the report of the Supervisor of the Plantation at Stellenbosch is appended.

It appears necessary to recommend that the price of Jacquez cuttings be increased to £1 per 1,000 in order to meet working expenses, but not as is generally believed by many to make profit. Farmers should get rid of the erroneous impression so often expressed, that the Plantation is being run in order to benefit the State financially and in competition with farmers. The Plantation is solely there for the benefit of Viticulturists.

In the 1906 report reference was made to the quality of healthy fruit borne by Hanepoot grafted on the 1202 Hybrid, in justification of its adoption. This year, however, the crop is not quite so abundant as on Jacquez. The bigger block since planted will be a surer guide as to results.

Several experiments, the results of which are tabulated below, were carried out with different scions on various stocks. Owing to the previous want of suitable nursery soil, which has since been found, the results will afford no sure criterion, but will yet be of interest:—

Stock.	Scion.	Results per cent.	Stock.	Scion.	Results per cent.
Aramon Ganzin	Hanepoot White	5	Du Lot	Muscadel Red	41
Do.	do. Red	5	Hybrid 101–14	do. do.	17
Du Lot	do. White	11	Do. 1202	do. do.	12
Hybrid 101–14	do. do.	27	Do. 3309	do. do.	8
Do. 1202	do. do.	30	Do. 3306	do. do.	10
Do. 3309	do. do.	4	Do. 44–01	do. do.	16
Do. 3306	do. do.	39	Du Lot	Pontac	34
Do. 44–01	do. do.	40	Hybrid 101–14	do.	11
Do. 101–14	do. Red	20	Do. 1202	do.	4
Do. 1202	do. do.	8	Do. 3309	do.	6
Do. 3309	do. do.	10	Do. 3306	do.	8
Do. 44–01	do. do.	45	Do. 44–01	do.	5

ORCHARDS.—Due attention has been paid to the tillage and scarification of the orchards. Regular application of Arsenite of Lead has brought about most satisfactory results in combating Codlin Moth. Peach Curl (Exoascus Deformans), in spite of spraying, was somewhat severe at the commencement of the season, but, owing to later improved weather conditions, has almost disappeared. The Fruit Crop last year was somewhat large, the sales amounting to £252 5s. 7d., as compared with £50 12s. 6d. collected during the previous year. This season's crop of Stone Fruit is scarce, while Pears are plentiful.

Certain blocks of the Orchards are by no means worthy of the Estate, representing a jungle of the ancient and modern in age and variety. Room for improvement lies in this direction, and the old decayed Saffron Pear trees, forming excellent cover for insect pests, etc., should be removed, as they neither produce healthy fruit, nor are they ornamental.

Gaps in the Peach orchard have been filled in with Royal George and Crimson Galande, varieties known to be suitable to the District.

CONCLUSION.—Apart from the Management of the Estate, technical information appertaining to Viticulture has been supplied to farmers and others. In April a tour of inspection of the vineyards in Colesberg, Middelburg, Graaff-Reinet, Aberdeen, and Jansenville was made, in order to ascertain how far Plasmopara Viticola has spread in the Colony. A report bearing on the subject was furnished on the 28th May.

Several inspections for Phylloxera have been made in this District, as well as one at Montagu, which was found to be infected.

T. L. WATERMEYER, Manager.

Annexure to Appendix.—Report of the SUPERVISOR of the GOVERNMENT PLANTATIONS at STELLENBOSCH, for the YEAR 1907.

The Vineyard yielded the following cuttings, viz.: Riparia, 300,000; Aramon, 219,000; Metallica, 98,300; Jacquez, 103,200; Second class (mixed), 249,000, making in all a total production of 969,500 cuttings.

The demand for Aramon and Jacquez was very great, in fact it was greater than the supply, and in consequence all these cuttings were sold. Out of 300,000 Riparia only 87,500 were disposed of, and of the 98,300 Metallica only 55,500, leaving an undisposed balance of these two specialities of 255,300. The second class cuttings were disposed of at a uniform rate of 5s. per 1,000. The Jacquez Grape crop was sold for £16 18s.

The Revenue for the year amounted to £311 15s., while the expenditure for wages was £103 18s., leaving a surplus towards rent, etc., of £207 17s. As compared with last year, the Revenue is £135 14s. 3d. less, but had I been able to dispose of all the Metallica and Riparia cuttings, it would have been the same as last year. Further, Jacquez cuttings were sold at 40s. per 1,000 during 1906, and only at 10s. per 1,000 in 1907. I would strongly suggest that during the coming year these cuttings be sold at 20s. per 1,000, as all the Farmers and private individuals were selling at £2 to £2 10s. per 1,000 last year.

The expenditure, on the other hand, is the same as the previous year, and I have tried my best to keep it as low as possible.

The Plantation is in perfect good order. The two truck loads of manure have been of great service, and there is a great improvement in the Vines for which it was used, especially so in the case of Aramon and Jacquez. The expense of manuring the Vines will repay itself handsomely, as I am expecting a larger yield this year.

During the year I was called upon to do inspection trips to different districts in addition to my ordinary duties, and I also acted for the Manager at Groot Constantia whenever he was called away on other duties.

A. J. CLOETE.

APPENDIX VIII.

REPORT OF THE HORTICULTURAL ASSISTANT FOR THE YEAR 1907.

The duties of the past year were, as formerly, while at headquarters, devoted to attending to callers seeking information on cultural matters and replying to queries by letter, on planting, pruning, picking, packing, manuring and marketing of fruits, and almost every phase of pomological work. Most of the country shows were visited, at which I acted in the capacity of judge in the fruit sections, and met and was interviewed by farmers. Then—in accordance with instructions—I proceeded during the fall of the season to some of the chief fruit-growing districts of the Colony, for the purpose of examining and reporting upon the state of the fruit industry, as well as to deliver lectures, and, as far as possible, give such practical demonstrations on planting, pruning, etc., as my personal experience might enable me to suggest. Such visits have enabled me to learn and correct any of my former views by every title of observation of the results of other men's working, and to renew, by personal intercourse between growers having a common object in view, that touch the Department specially wishes to bring about. The districts of Clanwilliam, Cathcart, Queenstown, Toise River, Komgha, East London, King William's Town, Adelaide, Bedford, Albany (including Lower Albany), Graaff-Reinet, Uitenhage, Alexandria, Aberdeen, Oudtshoorn, George and Mossel Bay were visited, and meetings held at the several sites selected by the local farmers and fruit-growers' associations on farms or elsewhere in the district.

It is as well to place on record the line that has been taken in addressing the farmers and others whom I have met. At the present step of the fruit industry in some of the districts gone over, one has to begin with first principles, especially when addressing those wishing to start fruit growing, and to see that the surroundings are properly considered, so that the most favourable lines to which they point are selected. For those who lie in close proximity to the railway it has been pointed out that the highest profit lies in the output of fresh fruit to be placed upon the markets here or abroad for immediate consumption. In cases of outlying localities with inferior means of communication, it has been shown that they are too seriously handicapped by distance and rough roads to attempt a fresh fruit business without great risk. Under such conditions the alternative is that of producing fruit for preserving, canning or drying, and this fact harks back to what I always strongly urge, and that is the matter of local co-operative establishments for handling the products. Among the fruits for drying, the fig has been waiting this long time for someone to deal with it on the scale which the imports from other countries have been pointing out to us. Fresh Cape figs are equal to any figs produced in the world; dried Cape figs are but seldom seen. Someone must grow the fig for its own sake and on the large scale for drying, instead of condemning it, as at present, to the low subordinate position it now shares with the quince. These two valuable fruits are for the most part treated as hedge-row conveniences, and the farmer has so got into the habit of seeing them in this position that it scarcely comes into his mind to consider what a first-class product might be got out of them if they were put into a place of honour and received the fair play conceded to the pear and peach. And I do not think, seeing that we now turn out dried peaches, apples and pears to compete in quality with anything the world's market can show, that it will be a long time before someone who grows figs to the perfection possible in this beautiful climate of ours, will find how to dry them to perfection and beat the imported stuff out of the market. The prune, I am glad to say, is already being dealt with in a most creditable way on the large or commercial scale.

Then have followed suggestions of a general kind, with reference to soil, aspect, shelter, selection of sorts and the class of tree suitable, pruning, picking, packing, marketing, etc. It would be easily understood that this very general conspect of subjects planned beforehand for discussion with our farming friends is necessarily traversed by all sorts of collateral matters, such as dealing witht insect pests, sorts and prices of agricultural appliances, the choice of manures and a dozen other things, each of which might be considered as belonging to a different specialist. I take it, however, that my duty is clearly to do whatsoever my hand finds to do on tour, and I have always given the best information which an experience of many years could supply, and although such advices will no doubt often be limited, yet in practice they are far better than would be a refusal to consider anything except what is within the official programme of duty.

It is a healthy sign that the Associations of our Fruit-growers continue to exchange mutual intercourse concerning practical results, and that such interest is increasing year by year. Mistakes in selection of sorts have undoubtedly been made, but these beyond question have of themselves a certain educative force. The great thing to be avoided is the dead level of stolid conservatism and satisfaction with old unimproved methods practised from time immemorial. And one of the most noteworthy signs of improvement is the growing dissatisfaction with the average Cape seedling and sucker stuff producing fruit without a name and often without a quality to recommend it. The low price obtained for this product has done much to cure the evil. The large buyer will only take good fruit, known to the markets of the world by name. It is also a matter for congratulation that the nursery trade is putting out, at a popular price, first-class deciduous and citrus young trees, propagated by graft or bud, worked upon approved stock and free from insect pests. Not many years ago it was impossible to obtain a sufficient number of any one valuable sort of fruit tree to start a commercial orchard on modern lines; this, happily, is a thing of the past. The principal representatives of the trade are now men who thoroughly understand their profession, and may be considered as missionaries of the higher fruit culture, penetrating into the dark places of the Colony and replacing the old worthless seedling trees with the new improved varieties, known and valued in the world's markets. The fact that the fruit farmers are becoming quick to recognise where their interest lies is evinced by the large extent to which certain kinds of fruits have disappeared from the export shipments and their place taken by others which have been found better suited for transport and fetching better prices. It is therefore obvious that we have not now as heretofore, to rouse a dormant intelligence into something like business smartness, but that anything we can show to be an improvement either in method or kind will not lack a ready appreciation. And perhaps this spirit may lead to the suppression of what is a serious drawback to our export trade, viz.: the pernicious custom whereby some take upon themselves to buy up and pack fruit anyhow, and rush them on to the Covent Garden sales as "Cape Fruit," to the utter ruin of whatever prestige our best fruits, selected and packed by the best men, may have gained.

It is gratifying to have to report that the same activity that I had noticed on a previous visit, in breaking up the land and setting out new plantations of fruits has been maintained in the present year. This is particularly the case in Lower Albany, Komgha, and Alexandria.

Without presuming to make any forecast as to what may be the Department's intention for the future, I would beg to be allowed to draw attention to the pressing need which still exists in this Colony for some better instruction to farmers' sons and others, than can at present be obtained in fruit growing, picking, packing, and marketing on modern lines.

There is a considerable number of intelligent Colonial young men, and some from oversea, accustomed to farm conditions of life, and in some cases with a fair amount of capital, who are anxious to learn fruit culture in all its branches. Now no place to where these young fellows may be sent to receive the necessary tuition they seek exist, for few, if any, of our better and more advanced fruit-growers will take them under any conditions, for they, human like, do not wish to initiate others into the art and mystery of the industry they themselves are gaining a livelihood from.

Many of our youths are finding wine-making and the customary cultures of the old farm unremunerative. They are becoming unhesitatingly alive to the fact that the want of ample capital to start with, the high price of suitable farms, drought and obscure diseases are making stock-raising more than ever a game of chance for the poor man; they also share the prevailing impression of the poor profit to be obtained from wheat production in this Colony. These are the men who would very willingly turn their attention to fruit-farming if they only knew how.

The vigorous youth of our farm population naturally object to begin life with so uncompromising an outlook. They see that the fruit industry here, even within its present small extent, has called for the services of skilled assistants from oversea, and naturally they wish that they had the means of gaining the same skill which these foreigners have acquired elsewhere. The question recurs, since these men cannot get their knowledge on fruit farms, must they start the fruit industry without any acquired traditional knowledge and insight into the successful proceedings of others, and only achieve success by the wasteful process of trial, blundering, and trying over again.

It may be pointed out that fruit-growing as well as useful academical instruction is given at the Elsenburg College. But it is no derogation to the excellent and hard-working manager of that establishment that their course of fruit culture does not and cannot possibly fulfil the requirements of a grown man who has perhaps been a farmer for years, and desires to learn upon a fruit farm how he shall best start and run another at a profit to himself.

In calling attention to this matter, I am urged to do so by the pressing nature of the question as to instruction on fruit culture. But the matter has another side which will come home to the understanding of the political economist. The tendency of the times has for a long time past, and is now, increasingly towards the sub-division of farm properties, and it is now beginning to be felt with increasing force that the methods which ensured a living upon areas counted by thousands of morgen fail utterly when applied to plots measured by the hundred. For this incontestable disintegration of lands, generously apportioned of old time, there is no remedy, dependent as it is upon the laws of population. To the new conditions of sub-division must be applied new conditions of culture.

One must recognise that the widespread tendency towards the fruit-farming industry here is the result of an instructive and most accurate appreciation of the conditions above indicated; and the sooner we at the Cape get to understand that our diminished holdings call upon us for a higher and more profitable culture of every rood of our cultivable land, the easier it will be for us to make our living from the soil of the land of our birth.

C. EUSTACE PILLANS,
Horticultural Assistant.

Appendix IX.

REPORT OF THE REGISTRAR OF BRANDS FOR THE YEAR 1907.

I have the honour to submit my annual report on the working of the Brands Registration Act No. 12 of 1890, as amended by Acts Nos. 18 of 1892 and 4 of 1897, during the year ended 31st December, 1907.

232 new applications were received during the year, and 178 Certificates of Registration were issued, as follows: Aberdeen, 23; Albany, 11; Alexandria, 1; Barkly East, 1; Fort Beaufort, 1; Gordonia, 4; Herbert, 4; Jansenville, 1; Kimberley, 5; Komgha, 1; Ladismith, 5; Mafeking, 31; Port Elizabeth, 1; Queenstown, 3; Somerset East, 5; Stutterheim, 1; Tarka, 42; Uitenhage, 25; Vryburg, 10; Willowmore, 3.

The difference between the two totals represents mainly the number of applications in regard to which further enquiry is still being made, or which have been returned for amendment, so as to conform to the requirements of the regulations.

During the year the provisions of the Acts were extended to the Divisions of Humansdorp and Steytlerville, making in all 28 Divisions in which they are now in operation.

It is to be regretted that the Divisional Councils of the remaining Districts of the Colony, or, at any rate, of those Divisions in which there are considerable numbers of stock, should delay application, the initiative resting with them, for securing the advantages which registration of brands confers in the direction of minimising loss through theft and the speedy recovery of strayed animals.

The present Acts, as has been pointed out in my previous reports, are undoubtedly susceptible of improvement, and I can but once more strongly urge their amendment on the lines therein indicated.

BARRY McMILLAN,
Registrar of Brands.

APPENDIX X.

REPORT OF THE GOVERNMENT DAIRY EXPERT FOR THE YEAR 1907.

I have the honour to submit my annual report for year ending December 31st, 1907.

Having only been appointed Dairy Expert to the Cape Colony on November 20th of this year, I am not in a position to speak generally of the Dairy Industry of the Cape, but can only report briefly on the cheese-making industry of East Griqualand, which district I proceeded to immediately after being appointed to my present position.

Speaking generally of East Griqualand, it appeared to be a very fine stock-rearing country, possessed of an excellent climate, and well suited to the production of first class butter and cheese.

It would be very far from the truth to say that this district has been fully developed, and one could not help being struck with the vast possibilities which this particular territory possesses and which at present remain in a dormant state, owing to the lack of railway communication to the several South African markets.

During my tour I met a large number of resident farmers interested in dairying, and I also visited the cheese dairies belonging to Messrs. Gunther, Rennie, Kirk, Cole, Young, Moxham and Carter, Matatiele.

I stayed at these centres for periods ranging from 2 to 4 days according to the amount of work to be done, and all the cheese-makers I came in contact with appeared to have an intelligent grasp of the work they had in hand, and seemed pleased to discuss the many technical difficulties which from time to time are bound to crop up, when engaged in the somewhat difficult task of producing first class cheese under South African conditions.

The quantities of milk being received at the various dairies for conversion into cheese, varied from 80 gallons to 450 gallons per diem, and it was the general opinion that these quantities would considerably increase as the season advanced.

The system of cheddar cheese-making adopted by the various makers only differed in detail, and was practically on the same lines as the systems prevailing in Australia and Canada. So long as the main principles underlying the systems referred to are strictly carried out, I see no reason to suggest anything different, except variations in detail which experience teaches from time to time should be made.

The cheese-making industry of East Griqualand has already reached an important stage in its history, and the quality of cheese produced, is of a very creditable standard of excellence, and the continuance and improvement of the standard already established, should be the main object of both cheese-maker and supplier.

The terms offered to suppliers are to my mind fair and liberal, as not only is the milk collected from each individual farm, but cans are supplied also.

I am afraid a great many suppliers have still much to learn in the handling of their milk previous to its arrival at the factory. Neither do they realise how handicapped a cheese-maker is through receiving milk in a tainted and dirty condition. That milk does arrive in this state I can prove from personal inspection, and no cheese-maker living can turn out a nice flavoured cheese from this class of milk.

What is required is more personal supervision on the part of the supplier over his black employees, also more careful sieving or straining of the milk. Many of the milk strainers in use are worse than useless, and unless some such strainer as the "ulax" which is provided with a filter cloth that can only be used once, is utilised, I should advise as an alternative, either passing the milk through butter-muslin folded 3 or 4 times, or else placing a clean piece of white flannel over the mouth of the milk can.

Either of these methods is infinitely superior to the ordinary class of strainer, generally in use, and the only precautions necessary to observe when using the cloth strainer, is to wash it thoroughly in luke-warm water, then rinse it in boiling water, doing this immediately after use, and then air it well until required again.

Milk cans should also be turned up-side-down on a wooden rack and well aired, and just before use should be washed out again with boiling water. I am also of opinion that milk which travels more than 5 or 6 miles, should be passed over an ærator, if it is to arrive in anything like a sound condition, during the hot summer months.

If suppliers of milk to the different cheese factories would only pay attention to the few simple details I have just referred to, I feel sure there would be a vast improvement in the flavour and condition of the various milk supplies and an equally beneficial effect on the quality of cheese produced.

(Sgd.) ED. O. CHALLIS,
Government Dairy Expert.

APPENDIX XI.

REPORT OF THE WOOL EXPERT FOR THE YEAR 1907.

I have the honour to submit my report for the year 1907.

During the past year I visited 32 Districts, holding 36 meetings at which 1,537 farmers attended, giving an average attendance of 48 farmers, the numbers ranging from 10 to 120, according to the District in which I was. I visited the more outlying Districts, away from the Railway, where huge tracts of country are required to pasture the sheep, necessitating the farmers driving long distances; to obviate this I met them by holding my meetings at Nachtmaal, Stock Sales, Association meetings, etc., thus having greater distances to travel myself, but saving the farmers. I was well repaid in doing this, as I came in contact with men I would not otherwise have met. I also held innumerable informal talks to farmers wherever possible.

I visited 46 farms, upon most of which I demonstrated during shearing, although the time I could spare was very limited, being from one to fourteen days.

These farm visits have been productive of beneficial results, as by initiating systematic work I was able to put everything in thorough working order, leaving an object lesson for the whole District. At these visits I also demonstrated how to class the sheep by selection, so as to improve the existing flocks and have a standard to be followed.

I also attended numerous Congresses and Wool Growers' Association meetings in the interests of the proper get-up of wool; and these are doing good work, but are not supported as thoroughly as they might be by those interested.

In reviewing the result of the work, I find that a decided improvement in the preparation of wool for market has taken place. I base this assertion on information supplied by wool buyers, forwarding, shipping and selling agents, and from personal inspection at the different Ports of shipment, as East London, Port Elizabeth and Cape Town, also from the very favourable reports from the following leading wool houses in England.

Mr. Chiappini writes, in a letter dated the 9th inst., as follows:—

> I have made careful enquiries amongst the leading wool brokers and wool buyers in London as to the question of Cape wools, and I am now prepared to deal only with the question of the effects of the recent improvements in the getting-up and classification of the wools, and also the question of a national brand.
>
> *Re* GET-UP AND CLASSIFICATION.
>
> The general opinion of the brokers and dealers is that there has been considerable improvement in this direction, and that all such improvements are much appreciated by the buyers, though there is still much room for further improvement.
>
> Messrs. Findlay, Durham and Brodie, of 110, Cannon Street, E.C., write me as follows :—
>
> "That during the last season there has been a very considerable improvement in the get-up of certain Cape clips of wool, and there is no doubt that this improvement has had a favourable effect on prices."
>
> Messrs. Helmuth, Schwarz and Co., wool brokers, of 3 and 4, Moorgate Street, E.C., write to the same effect. They say :—
>
> "There is no doubt that a great improvement has been effected in the getting-up and classifying of the wools under the control of the Associations, and we trust that this improvement will make further progress."
>
> Messrs. Henry P. Hughes and Sons, wool brokers, of 10, Basinghall Street, E.C., says :—
>
> "It is high time that steps were taken towards the improvement (especially in the get-up) of Cape clips of wool, and it is very pleasant to be able to state that already in many cases better prices have resulted. Many clips, however, still show a lamentable want of care, and so sell far cheaper than they would do if properly got up."
>
> Messrs. Thomas and Cook, wool brokers, of 73, Basinghall Street, E.C., say :—
>
> "We are very pleased to note that an effort has been made to more carefully class and skirt wool clips from the Colony."
>
> Messrs. Willans and Overbury, wool brokers, of 7 9, and 11, Moorgate Street, E.C., say :—
>
> "There can be little doubt that the efforts of the Association have resulted in a general improvement in the classing and get-up of the wool from South Africa."

A great quantity of the wool can be greatly improved in the preparation for market, and by improving existing breeds of sheep give more uniformity, and not be a country of samples.

Of course, we cannot hope to reap the full benefit, from a monetary point of view, until the improvement in get-up has been proved to be lasting. This, combined with uniformity of quality and condition, I have no hesitation in stating, will cause our product to take a leading position in the world's markets. This much-looked-for improvement really commences on the sheep's backs, and will take several years to accomplish.

The improvement in methods and get-up of the wool is not confined to any one section of the farming community, but applies to all. Farmers as a whole show keen appreciation of any effort to improve sheep breeding and wool production, and are doing all in their power to improve present conditions by seeking all information possible on this subject, as is proved by the large attendances which, I am pleased to say, attended my lectures and demonstrations.

At the same time, I consider that the Government could facilitate matters considerably, and give the poorer class of sheep farmers more facilities than they do at present. The sheep and wool industry of Cape Colony has had, up to the present moment, very little, if any, assistance from the Government, and as our output of wool is valued at something over £2,000,000 sterling per annum, judicious assistance in the right direction would double this amount.

In several Districts visited by me great loss, both to the farmer and incidentally to the Colony as a whole, is due to want of the proper stock, of undoubted purity, to suit the farm. Experiments as to what class of sheep and wool suit the particular District, I submit, should be undertaken by the Govrenment, and would give us in time the uniformity so much to be desired in our South African flocks and wool. At present the majority of farmers are groping along in the dark with a class of sheep totally unsuited to their locality and climatic conditions.

Therefore, I would suggest that experiments be carried out in the following manner: Get a number of farmers from different Districts in the Colony who will undertake to do this work, *i.e.*, say three to ten ewes to be supplied to them free of cost by Government; these ewes to be previously served by the same type of ram, belonging to Government, and the farmer to run the ewes under the same conditions as his ordinary flock; but, when taking over these ewes, they are to be specially marked, and with regard to these, as well as an equal number of ewes from his own ordinary flock, the dates of shearing and lambing, weights of carcase (live weight) and fleece, and results of progeny are to be recorded. These fleeces are then to be valued in the grease, scoured, and the percentage of loss and value of clean wool obtained. All these particulars can be specified on a form, and as the experiment progresses the most valuable sheep to that particular District can be ascertained; and when once this particular type of sheep is proved to be the best for any particular locality, it will then be safe and sure ground for all the surrounding farmers to follow, thereby giving a larger percentage of clean wool of a uniform type, so that the wool, from a manufacturer's point of view, will be of one sort, suited to his requirements. We thus derive benefit by meeting the requirements of the manufacturer, and grow a uniform wool with a uniformly high value. Then speculators, who are ignorant of the conditions guiding the grower or farmer, and consequently, by their advice, do harm instead of good to the industry, will cease advising the farmers what class of wool to grow.

The wool might not be everything that one would desire, but we would then get a uniform raw article which would help to establish our name, and the farmer would then be sure that he is doing the best he can with the land and pasturage at his disposal. It has been proved beyond a doubt in other countries that certain sheep give the most valuable result in particular Districts. The monetary outlay to the Government would not be very great, and in the near future the increase in price of wool and sheep would more than reimburse the country. Some of our leading and wealthier farmers could, and would, I have no doubt, experiment on their own account, by getting a few pure-bred sheep, say Saxony, Rambouillet, Vermont, Tasmanian or Australian, and compare them with the existing flocks in weight of carcase, weight of wool, clean value, etc., and ascertain what particular breeds would thrive and be most suited to their particular District or farm. Farmers, as a whole, cannot afford to carry out these experiments; only the more favoured ones can, and so I hope the Government will give it their earnest consideration.

Another item which the Government could undertake with advantage to the farmers, and direct gain to the Colony as a whole, would be the establishment of a sheep stud farm, *i.e.*, from all the different countries where sheep are bred, such as France, America, Germany, Australia and Tasmania, select a few of the best pure-bred rams and ewes, and have them brought here and run in separate paddocks, keeping each strain pure, so that when the farmers require high-class pure ewes or rams they will be able to draw on whatever type they require, and be sure of undoubted purity of type, besides buying the sheep at a greatly reduced rate in the Colony. I suggest that the progeny of this stock grown in this Colony could be purchased by the farmers to improve their flocks.

By the establishment of a farm of this sort, the farmers could come and select personally for themselves, and get the progeny of the best sheep to be had at cost price plus expenses, and they also would be acclimatised and ready for the farmer when required. The trouble and risk to obtain better sheep, as a rule, prevents many farmers from purchasing at all. These risks would be minimised in the hands of experts. I do not think this stud farm would in any way be prejudicial to the present breeders of high-class stock at the present moment, but would assist them in getting good stock on the spot without having to pay large amounts to the importers. All that would be required by Government would be a small healthy farm, jackal-proof fenced, and sub-divided into paddocks, with shelter either of trees or small sheds, and a certain amount of lucerne and rape, etc., put in. We do not want any elaborate farm or buildings, but should simply proceed on the same lines that the ordinary farmer could adopt, giving him a good, serviceable animal, used to farm conditions, which he could rely on, and with the advantage that he could always come back and obtain the same strain to build up his flock again. I am sure if this was done the small and poorer class of farmers would have the opportunity to improve his sheep and wool. As we must have something good to work upon if we wish to derive the full benefit of up-to-date methods, this, the foundation, is one of the most important subjects for the welfare of the sheep and wool industry.

Another very important point, and which goes hand in hand with good class sheep, is fencing. Farms, or blocks of farms, or parts of the country, should be fenced with jackal-proof fencing, so that the sheep could run day and night; in fact we are not going to hold our own, or the farmer get the full benefit in the sheep or wool line until this is accomplished. One has only to look at the improvement in the country, condition of sheep and cleanliness of the wool when the sheep are allowed to run day and night, to prove this. Every effort should be made for this end by both Government and farmers, and then we will know that the sheep and wool industry, as a whole, is carried out on improved lines. I feel confident we will never produce first-class clean and uniform wool whilst kraaling is the order of the day.

A decided move is being made by the farmers in Cape Colony to prepare their wool properly for market, through their different Associations of the National Wool Growers' Association, and I would like to urge upon all the necessity of doing their work thoroughly. The eyes of the Home and Continental wool buyers and manufacturers are now focussed on the wool coming from South Africa, and if the farmers will only hold the ground gained this past season, and further still improve their methods, the result will be more enquiries for certain specific high-class wools which we can supply. If the farmers will only exercise a little patience to regain their lost reputation, I think that the trouble and care entailed will have lasting results, more especially when the value of wool comes down to its normal level. It will be then that the grower of inferior wool will feel the pinch, through inferior and badly prepared wool. On going into the methods adopted by many of the farmers this year, I find that there is much to be done yet before the wool can be said to be properly prepared for market. In some cases the work has been over-done, thus causing a monetary loss to the grower by putting good wool with inferior. This mistake will not continue when the farmers get more used to the work. In some cases, on the other hand, it has been *vice versa*—inferior wool having been left with the good wool—thus detracting from the full value. So to those who say they have done the work and it has not paid them, I say: "Be very sure before you complain that it is not your fault." It may also be due to the method in vogue of selling.

During my visits to the different Ports of Cape Colony, I have made a close study of the methods adopted by the farmers in the classification or preparation of wool for market. After long and careful thought I have come to the conclusion that a great deal of time and money is being wasted by the farmer through the improper or, rather, over-classification of their wools, a great many farmers doing the work when the condition of the wool does not warrant it. Such being the case, the loss naturally accrues to the grower, at the same time in no way helping or assisting the buyer or manufacturer. I would like the farmers clearly to understand that to derive any monetary profit they first of all must have a certain amount of clean wool to work upon. Taking this for granted, it will amply repay the efforts of the farmer in this direction. When, on the other hand, the wool is very heavy in yolk, or very earthy and sandy, it will not pay to do more than make it as presentable as possible. With this object in view, I would like farmers who have any doubt on this score to come to their own decision by experimenting in a small way before attempting to do any elaborate classing, as no hard and fast rule can be laid down to meet the great varieties of wool grown in Cape Colony. It has constantly been brought to my notice that the work, undertaken with enthusiasm and in all good faith, has, to a certain extent, been nullified owing to lack of knowledge, thus causing a certain amount of loss to the producer. [To cite one instance: A fleece alleged to be properly skirted and rolled was sent me for report. Upon opening this fleece I noticed that it was rolled in such a way as to include the most inferior wool of the fleece, namely, the back. Another point was, in going through the skirtings I found a great deal of good wool quite equal to the best left in the skirtings very much superior to the back, which was included. Now, work of this description defeats the object we have in view, *i.e.*, uniformity.] The long and short of it is that we want all one class of wool put together, *i.e.*, if it is all heavy in grease and earthy let it go together, and if clean and light it should be kept separate. In going over this fleece I found, when re-sorted properly, that the amount of skirtings was not increased, nor was the fleece decreased in weight; it was simply rearrangement or returning to the fleece wool which should not have been taken away, and taking out of the fleece inferior wool which should have been removed, and was consequently detrimental, thus showing that the work undertaken by the farmer was misapplied owing to want of training and knowledge. To further test the result of the different classing, I submitted the wool to a scouring test, giving results which clearly prove that it is advisable to remove wool which contains a larger amount of shrinkage than the bulk of the clip. A difference of 10 per cent. was made by this means in this case.

This brings me to another suggestion, viz., to start, either in connection with one of the existing Agricultural Colleges or farms, or by itself, a practical Wool and Sheep Institute, where young farmers could be trained in all the branches pertaining to sheep farming, from breeding sheep to the preparation of wool for market, and all scientific knowledge adopted, as in America and Australia. This might be carried on in conjunction with the Stud Farm previously mentioned.

Machine shearing could also be taught to the poor whites, and anyone who wishes to specialise in any particular branch be allowed to undertake a course, say, of three months.

Lectures could also be delivered at Elsenburg College during the winter months, and practical instruction given for, say, two months; but facilities must be supplied for this purpose, such as models and diagrams of shearing sheds, kraals, and other useful matter pertaining to the sheep industry and adapted to South Africa. Collections of typical wools from all parts of the world, the different fabrics and cloths made from different wools, giving the young farmers an intelligent interest in the work, and thus enabling them to know the pros and cons of the business, would give them a keener interest in the industry.

To sum up, all our requirements for the present would be:—

1. Suitability of sheep to District and uniformity. (Experiments and Stud Farm would supply this want.)
2. Fencing, jackal-proof. Government should strain a point to supply this important want.
3. Training at College or Institute, to ensure proper and uniform methods being adopted.

In the past year I spent a month lecturing and demonstrating at Lovedale Institute and Elsenburg College, with, I believe, very beneficial results to the younger generation.

In conclusion, I might reiterate my remarks in my last report, that the wool and sheep industries of the Cape Colony can, with care, hold its own with any wool production of the world. At the same time we have not enough of it to hold the attention of manufacturers, and to this end I have endeavoured to show on broad lines what could be done by the Government in granting as much assistance as possible, which, I trust, they will see their way clear to do.

W. M. McKEE,
Government Wool Expert.

Appendix XII.

REPORT OF THE SENIOR ANALYST FOR THE YEAR 1907.

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I. INTRODUCTORY.

(i) *General Analytical Work.*—A very much larger number of samples was dealt with in the Laboratories in 1907 than in any preceding year. The samples analysed during the year under report totalled 3,370 in all, of which 2,636 were dealt with at Cape Town, those analysed in the Grahamstown Laboratory numbering 734.

The total of 3,370 samples analysed is an increase of 43 per cent. upon that for the preceding year, during which 2,352 samples were analysed. Milk constituted a large proportion of these, 1,419 samples having been under analysis during the year, coffee coming next with 197, then wine with 172, and brandy with 161. In addition to these and various other articles analysed, sixty-four, mostly minerals submitted by private persons, were gratuitously reported on without the need for actual chemical analysis.

(ii) *Financial.*--The following statements summarise the expenditure and income of the Laboratories during the past year: —

Expenditure Vote, 1907 1908.	Cape Town.	Graham's Town.	Total.
	£	£	£
74. A. Officers' salaries	1,957	907	2.864
74. B. Messengers' wages	128	36	164
74. B. Transport and Subsistence	5	...	5
74. B. Reference Library	10	6	16
74. B. Gas	*	46	46
74. B. Chemicals and apparatus	370	61	431
74. B. Goods, carriage and insurance	21	10	31
74. B. Sundries	29	21	50
Total	2,520	1,087	3,607

* Paid by Public Works Department : no means of ascertaining amount.

The summarised tariff values of analyses performed are :—

	Cape Town.	Graham's Town.	Total.
	£	£	£
Fees paid by other Government Departments	728	238	966
Fees paid by the General Public	96	169	265
Analyses performed free of charge for Government Departments...	1,698	562	2,260
Total	2,522	969	3,491

II. FOOD ANALYSES.

Analyses of food materials have been customarily dealt with in these reports under two sub-headings, namely: A, articles of food submitted for analysis in accordance with the provisions of Act 5 of 1890, "The Sale of Food and Drugs Act," and B, food materials other than those included under A.

A. Analyses under the Food and Drugs Act. A total of 2,249 samples were analysed in this connection during 1907, of which 230 were pronounced adulterated. The chief, in point of number, were:—

Article.	Number Analysed.	Adulterated.
Milk	1,248	54
Coffee	168	28
Chicory	155	8
Pepper	154	25
Brandy	127	16
Vinegar	120	51

Most of the samples thus analysed were received from the four Divisions named below: —

Division.	Number Analysed.	Adulterated.
Cape	707	57
East London ...	115	28
Kimberley ...	672	38
Port Elizabeth ...	116	12

Of the 2,249 articles analysed, 1,728 were examined in the Cape Town Laboratory, whereof 159, 9·2 per cent., were adulterated, and 521 in the Grahamstown Laboratory, 71 of which, that is to say, 13·6 per cent., were adulterated.

(i) *Analyses of Milk.* The adulteration of milk by means of formaldehyde* has apparently been suppressed, not a single case having been detected during the year under report; there were, however, three cases of adulteration of milk by means of boric acid.

An article called "Vacca melk," imported, sterilised, in bottles, yielded the following results upon analysis:

Specific gravity	1·0294
Total solids	11·06
Fat	2·96
Proteins	3·10
Solids not fat...	8·10
Water	88·94
Ash	·62

This milk was free from boric preservatives and formaldehyde, but it was of poor quality, especially when compared with some of the Colonial milks upon the Kimberley market. It is possible that the article is derived from Dutch cows, which are well known to yield milk low in fat, but as the above figures are all-round lower than the limits usually accepted here for genuine milk, it is plain that its sale as such would be detrimental alike to the consumer and to the local product with which it would compete.

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* See remarks in another connection on page 109 regarding the dangers of this form of adulteration.

During the year a large number of milk samples from Kimberley were submitted for analysis. In many of these the high percentages of fat formed a very striking feature; so much so indeed that I considered it worth while tabulating the comparative average results of such analyses as permitted of the same being done. The figures thus arrived at appear in the table below, which shows the averages for the milks purchased during 1907 under the provisions of Act 5 of 1890 (1) in the Cape Division, and (2) at Kimberley:—

Cape.

Quarter.	No. Analysed.	Specific Gravity.	Total Solids.	Fat.	Solids not Fat.	Water.
1st	57	1·0309	12·28	3·71	8·57	87·72
2nd	91	1·0311	12·58	3·88	8·70	87·42
3rd	146	1·0315	12·46	3·68	8·78	87·54
4th	197	1·0311	12·21	3·61	8·60	87·78
Summary ...	491	1·0312	12·36	3·69	8·67	87·64

Kimberley.

Quarter.	No. Analysed.	Specific Gravity.	Total Solids.	Fat.	Solids not Fat.	Water.
1st	Nil	—	—	—	—	—
2nd	151	1·0304	13·76	5·01	8·75	86·24
3rd	161	1·0308	13·17	4·43	8·74	86·83
4th	144	1·0320	12·76	3·85	8·91	87·24
Summary ...	456	1·0310	13·24	4·44	8·80	86·76

Apparently the proportion of fat reaches its maximum during the second quarter of the year, and falls off towards the fourth quarter. The other milk solids reach their maximum at a later period—in the Cape Division apparently during the third quarter, diminishing towards the first, while at Kimberley the solids-not fat—seem to attain a maximum when the fat is at its lowest, and *vice versa*. The above conclusions must, however, be tempered by the remembrance that in all the above cases the milk samples were simply those purchased under ordinary circumstances from milk vendors; no precautions were taken to ensure their genuineness, and in fact all the samples from the Divisions concerned, upon the analyses of which prosecutions for skimming and watering ensued, are included in the above tabulated results. It is obvious, therefore, that the milk would have appeared to better advantage had the table included only thoroughly representative samples regarding whose genuineness there could be no doubt.

As a comparison with the above, I append the following average results of analyses of milk procured *directly* from individual cows in the Cape Division during 1907:—

No Analysed.	Specific Gravity.	Total Solids.	Fat.	Solids not Fat.	Water.
110	1·0313	11·90	3·28	8·62	88·10

Here then we find the average milk obtained directly from cows showing worse results than the average of the 491 samples which included adulterated milks amongst their number. In default of any information as to the circumstances under which the genuine milks were taken, it will clearly be inadvisable to offer much comment upon these results, but obviously many of them are not to be taken as normal in their composition, so that they cannot be considered as sufficiently representative to base a general judgment as to the composition of the milk of the Division upon, however interesting they may be in throwing light upon the class of milk that is produced in individual cases under special circumstances.

It would, of course, be absurd to urge that all milks containing 1 per cent. of fat should be passed as genuine because some milks taken direct from cows have proved to contain even less than that amount. It would be equally unreasonable to raise the official limit far above 3 per cent. because, under certain conditions, cows have yielded abnormal milk containing nearly 9 per cent. of fat. Many of these abnormal results are due to disease, and not a few to unreliable methods of taking samples. Such a case as the following has occurred: On two occasions the milk from a certain cow yielded over 8 per cent. of fat; it was subsequently found that the cow had only just before been milked dry; she was then immediately fed and milked again, with the above result. In another case the yield of a cow was only a little more than eight ounces of milk, but that milk was abnormally rich. It would be highly unfair to base general standards on abnormal milks like these, hence the absolute necessity of the analyst knowing all the circumstances under which each milk was taken.

Of course, it is possible that the Kimberley milks may not have been thoroughly representative, and it must be remembered that the Cape as well as Kimberley samples in the above table cannot represent anything more than the market article. It would be desirable to investigate more thoroughly the composition of the milk of these Districts—and, indeed, of other parts of the country as well—taking the samples intended for analysis, in a reliable, scientific method, directly from cows: then only shall we be in a position to judge in how far present standards or limits are applicable. There has been a good deal of doubt as to whether, in some districts at all events, too generous limits are being allowed to vendors, and in some other portions of this vast country the reverse is hinted at. Points like these cannot be settled except by investigation.

In this connection, I quote the following passage from the last annual report of Dr. A. W. Reid, M.D., M.Ch., Medical Officer of Health for Kimberley:—

> "It is frequently asserted that a standard of 3 per cent. of butter fat in fresh milk is too high for this locality. On the strength of an analysis of a large number of samples of milk, I have no hesitation in saying that 3 per cent. is not too high. The average comes out much higher. Milk is often sold by some dealers giving a percentage less than the 3 per cent. standard: in the more glaring cases this is no doubt due to the addition of water, or of skimmed milk. On the other hand, in less obvious cases, I think it depends on the method of milking the cow. If it is merely the fore milk that is drawn off, the udder acts as a sieve, with the result that this portion of the milk is of poor quality, whereas the portion left for the calf to suck is of a high standard. I consider if farmers thoroughly milk their cows, neither the consumer nor the Government Analyst would have any reason to find fault with the quality of their milk on this score. It is a serious matter for young children and invalids who depend on milk for nourishment to be supplied with an article which does not sustain them."

(ii) *Analyses of Condensed and Tinned Milks.*—Analyses of thirty-one different brands of condensed and tinned milks have been made during the year under report: the articles were apparently in each case prepared from whole milk. Their chemical composition will, it is hoped, be published in some subsequent report, and in the meanwhile attention may be recalled to the remarks (with accompanying diagram) on pages 21 and 22 of my report for the year 1905.

(iii) *Analysis of Dried Milk.* Results of an analysis of an article of this class, Nutrium brand, were given on page 13 of my last report. A similar article, termed "Lacvitum," has since been examined with the following results:—

Total solids	93·82
Fat	20·07
Solids not fat	73·75
Proteins	20·99
Ash	5·72
Milk sugar	44·88
Water	6·18

On the label it was stated that "the contents of one packet will make from four to five quarts of pure new milk." This statement is not correct, inasmuch as such a mixture would contain barely 2 per cent. of fat, or about one-half the proportion that is contained, on an average, in the milk (adulterated as well as unadulterated) that is sold in the streets of Cape Town. (See above, page 89.)

(iv) *Analyses of Cream.* One article, wrongly sold as Jersey brand "cream," proved to be simply condensed milk: two genuine tinned creams were also examined, with the following results:—

Brand.	Total solids %	Solids not fat %	Ash %	Fat %	Water %
Banquet (Francis brand)	32·20	6·30	·59	25·90	67·80
Gold Reef	35·75	2·75	·56	33·00	64·25

(v) *Analyses of Butter.*—For many years no adulteration of butter, by means of margarine or other foreign fats, had been detected: an exception to this occurred during the year under report, when a sample of so-called "butter" was discovered to contain 85 per cent. of foreign fat. Fourteen grains of boric acid per lb. were found in the butter supplied to the Robben Island Hospital.

(vi) *Analyses of Vinegar.* I have nothing further to add to the remarks made on this subject in former reports. The sale of coloured and flavoured acetic acid, masquerading as vinegar, still continues. One vendor of this article—more honest than most—had labelled his wares: "VINEGARO. *This preparation does not comply with the Food and Drugs Act, 1890.*"

(vii) *Analyses of Brandy, Whisky, etc.*—As the "Wine, Brandy, Whisky and Spirits Act" of 1906 was not yet in fully effective operation, analyses of articles, which would at a later stage be dealt with under the provisions of that Act, were continued to be performed in connection with the "Sale of Food and Drugs Act" of 1890, which, as observed in my last annual report, did not provide sufficient powers to deal with wines and spirituous liquors. In future reports, this subject will be referred to in connection with operations under the "Wine, Brandy, Whisky and Spirits Act."

(viii) *Analyses of Lard.*—Thirty-one analyses of various brands of lard have been made in the Laboratories upon import during the last two and a half years. The results of these analyses it is intended to publish at a future date.

(ix) *Analyses of Pepper.*—Early in the year some samples of pepper were found adulterated with what is known in the trade as pepper dust, a term originally confined to pepper husks and sweepings, but now broadened out into a euphemism to cover adulterants of all kinds. Even where the latter is not the case, and a mixture of ground whole pepper, plus pepper hulls, is sold as though it were ground whole pepper pure and simple, the act should be looked upon as an adulteration. The definition of "ground whole pepper" adopted by the United States authorities, namely, that it is "the product made by grinding the entire *berry,* and contains the several parts of the berry *in their normal proportions,*" is in accord with reason and common-sense, and the addition of pepper husks to ground whole pepper is an adulteration of the same class, if not of the same degree and importance, as the addition of skimmed milk to whole milk, provided that both be sold without notification of what has been done to them. This is also the view expressed by Hartel and Will (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Vol. 14, 1907, pp. 567-579).

(x) *Analyses of Chicory.*—A wholly new feature, locally, in connection with the examination of chicory, was the discovery that an article submitted for analysis under the latter name consisted entirely of ground and roasted carob beans. Another feature, also in some respects novel, was the addition of five parts of acorn flour, coloured by means of "ferruginous clay," as an adulterant to four parts of chicory. Beyond these two occurrences, the chicory adulterations during the year were of ordinary type.

(xi) *Various analyses.*—A sample of *coffee* supplied to the Old Somerset Hospital was examined, and it was found that six parts by weight of roasted peas had been added to each one part of coffee. A sample of *fruit syrup* contained salicylic acid in the proportion of 4·3 grains per pint. An article called "*vegetole,*" apparently the same as that mentioned on page 30 of my report for 1905, appeared to be a mixture of cotton seed stearin with at least 12 per cent. of beef fat; it gave the following results:—

Oleorefractometer reading at 45° C	+ 5°
Iodine value	91·0%
Ether washed deposit	92·6 mgs.
Becchi's test	Immediate darkening.

(xii) *Nature of Adulterants.*—Below will be found a list setting forth the various articles and means which had been employed for the purpose of adulterating the samples of food and drugs examined under the provisions of "The Food and Drugs Act, 1890," during the year 1907:—

Milk—Water, abstraction of fat, boric acid.
Pepper—Nut shells, olive stones, rice.
Vinegar—Artificial concoctions, deficiency of acetic acid.
Sugar—Artificial colours.
Chicory—Sand, carob beans, acorns coloured by red earth.
Brandy—Water, wood spirit, artificial concoctions.
Whisky—Water.
Cream—Condensed milk.
Mixed Coffee—Beans, figs, peas.
Mustard—Flour (coloured by turmeric).
Coffee—Chicory, figs, beans, peas and other vegetable and farinaceous matter.
Lard—Beef fat, cotton seed stearin.
Cayenne pepper—Ginger.
Wine—Salicylic acid.
Butter—Foreign fat, boric acid.

B. Food Analyses: General.—Several samples of food materials have been analysed otherwise than under the provisions of "The Food and Drugs Act, 1890." The principal foodstuffs so analysed were: Milk, 171; wine, 164; brandy, 34; and water, 62. Some of the last-named were analysed for boiler and irrigation purposes.

(i) *Analyses of Water.*—The number of waters analysed, with a view to ascertaining their adaptability for drinking or culinary purposes, was rather smaller in 1907 than during the years immediately preceding; between 40 and 50 samples were thus examined. Most of these samples are tabulated below:—

Locality.	Source	In Grains per Gallon.			Nitrites.	In Parts per Million.				Colour through 2 feet tube.	Odour.	Clearness.	Amount of Sediment.
		Total solids at 105 ° C.	Chlorine.	Nitrogen as Nitrates.		Ammonia.		Oxygen Consumed.					
						Free & Saline.	Albuminoid.	15 mins.	4 hours.				
Aberdeen Road	Borehole	193·00	67·10	trace	much	1·066	·184	1·762	2·176	normal	nil	clear	traces.
Bedford	Spring	4·68	·84	trace	nil	·048	·102	1·431	2·332	light yellow	nil	turbid	little sediment.
Bedford	Spring	6·16	1·19	nil	much	·123	·142	·902	1·902	dirty yellow	nil	turbid	much sediment.
Bethesda Road	Borehole	24·92	2·24	nil	trace	·040	·034	·169	·215	normal	nil	clear	traces
Blaney Junction	Borehole	25·20	5·70	·012	trace	·136	·080	nil	·103	normal	nil	clear	traces.
Caledon	Steenbrazems River	6·0	1·70	·002	nil	·035	·190	6·738	10·093	yellowish brown	nil	clear	little.
Ceres	Mitchell's Pass River	3·2	·57	·002	trace	·008	·046	·287	·759	light brownish yellow	nil	clear	fair.
Dwaal	Borehole	29·96	1·96	nil	fair amount	nil	·052	·100	·176	normal	nil	clear	traces.
Elliot	Borehole	24·6	2·30	·240	very much	·014	trace	—	·187	normal	nil	clear	much.
Grahamstown	Rain	2·2	·6	·002	slight trace	·334	·105	·210	·216	light straw	nil	clear	—
Grahamstown	Town supply mixed with rain water	8·2	3·2	·001	trace	·177	·184	1·040	1·949	straw	nil	slightly turbid	—
Kenhardt	Well	52·0	11·14	·090	fair amount	·156	trace	—	trace	normal	nil	clear	fair amount.
Kimberley	Vaal River (filtered)	10·8	·35	·160	nil	·027	·112	·918	1·382	—	nil	turbid	much.
Kimberley	Vaal River (filtered)	15·3	·28	·100	trace	·029	·245	1·070	2·070	—	nil	turbid	much.
Kimberley	Vaal River (filtered)	13·0	·27	·030	nil	·038	·150	·417	1·423	—	nil	highly opalescent	very little.
Laingsburg	Well	32·0	7·60	·075	trace	·139	trace	·071	·201	normal	nil	clear	much.
Lobatsi	Pool	15·4	·44	·040	little	·065	trace	--	·119	normal	slightly earthy	clear	little.
Mafeking	Well	38·6	1·59	·063	little	·112	trace	—	·055	normal	nil	clear	trace.
Mowbray	—	22·8	8·84	·02	—	·028	·010	—	·038	normal	nil	clear	very much.
Mowbray	Waterhouse	22·3	9·04	·006	trace	·392	·102	trace	·116	normal	nil	clear	much.
Mowbray	Tap	22·5	9·02	·009	trace	·003	trace	trace	trace	normal	nil	clear	little.
Nelspoort	Borehole	23·3	1·24	·070	nil	·080	·016	·215	·335	normal	nil	clear	fair.
Paarl	Wemmer's Hoek River	2·4	·74	·002	nil	·012	·032	·186	·447	normal	nil	clear	little.
Philipstown	Borehole	68·14	11·57	·225	little	·051	·094	trace	·428	normal	nil	clear	very little.
Port St. John's	Well	27·6	3·89	·071	nil	·008	·056	·114	·543	normal	nil	clear	fair.
Rondebosch	Well	147·8	15·21	·080	very much	·981	·399	—	5·739	very faint greenish yellow	very faint earthy	slightly turbid	much.
Simonstown	Mountain stream	37·2	10.61	trace	nil	·022	·070	1·220	2·449	very light yellowish green	nil	clear	little.
Simonstown	Mountain stream	39·2	9·20	trace	nil	·032	·151	2·351	5·058	yellowish green	nil	clear	—
Simonstown	? Mountain stream	38·4	11·67	trace	nil	·053	·107	·949	2·129	very light yellowish green	nil	clear	fair.
Simonstown	? Mountain stream	42·5	11·49	trace	nil	·022	·151	2·805	4·273	light yellowish green	nil	clear	fair.
Somerset West	Springs	4·4	1·41	nil	trace	·039	·050	·429	·883	faint brownish yellow	nil	clear	much.
Somerset West	Springs	7·2	2·02	trace	trace	·053	·079	·985	1·658	light brownish yellow	nil	clear	fair.
Uitenhage	Sand River	8·1	3·18	trace	little	·175	·050	·929	1·971	light brownish yellow	nil	clear	little.
Uitenhage	Sand River (filtered)	8·0	3·13	trace	little	·032	·014	1·014	2·000	light brownish yellow	nil	clear	little.
Uitenhage	Sand River (filtered)	7·6	3·06	trace	little	·033	·038	1·056	1·645	light brownish yellow	nil	clear	little.
Umtata	Ntembezi stream	2·4	·34	·002	nil	·017	·019	·215	·415	normal	nil	clear	fair.
Vryburg (Zwartfontein)	Springs	28.6	19·8	·076	trace	·067	·054	—	·131	normal	nil	clear	fair.
Vryburg (Zwartfontein)	Springs	30·0	19·8	·071	trace	·059	·041	—	·118	normal	nil	clear	fair.
Willowmore	Borehole	189·0	61·43	trace	trace	·212	·113	·089	·880	normal	nil	clear	littlo.
Willowmore (Antonie)	Pool	130·48	47·46	trace	much	·400	·721	4·296	6·228	light yellow	slight organic	clear	little.
Willowmore (Fullarton)	Borehole	214·76	83·86	·0007	much	·032	·028	·386	·477	straw yellow	nil	clear	little.
Worcester	Hartebeest stream	1·4	·50	·004	nil	·032	·021	·516	·813	normal	nil	clear	very little.
Wynberg	Tap from mains	5·4	1·64	·003	nil	·022	·120	5·376	8·122	yellowish brown	nil	clear	very litt'e.

The samples from Caledon and Paarl Divisions were representative of the water which it was proposed to convey to Cape Town for domestic supply. In both cases the geological nature of the districts through which the rivers flow is that of the Table Mountain series; the former of the two rivers, containing a good deal of dissolved vegetable matter—the result of its passing through an area where "palmiet" grass abounds—resembles in this way much of the water now supplied to the city of Cape Town. The Paarl water is very much purer in that respect, and also contains a smaller proportion of mineral salts.

(ii) *Effect of Preservatives on Composition of Milk.*—Series of analyses of milk, previously treated with various amounts of different antiseptic agents, were made from time to time. The object in undertaking these investigations, which are still in progress, was to devise some means of preserving milk that would at the same time allow of its being transported over distances the traversing of which would occupy several days, and would, at the same time, permit of the samples being rapidly sorted by the Gerber or some similar process for the estimation of fat.

(iii) *Analyses of Wines.*—In order to acquire fuller information in regard to the composition of wines on the local market, with special reference to the speedy enforcement of the provisions of the "Wine, Brandy, Whisky and Spirits Act, 1906," several analyses of such wines were undertaken, one officer of the analytical staff, Mr. J. Lewis, M.A., being specially detailed to investigate the subject.

To begin with, thirty-eight wines procured from various stores were tested, for the purpose of ascertaining how far they accorded with the requirements of the above-mentioned Act. These wines included the following:—

Crown Port and Pontac, 3 samples each; F.C. Pontac, Sherry, and Colonial Red wine, 2 samples each; F.C. Sherry, Kimberley Club Sherry, Hermitage, and Cabernet du Sauvignon, 4 samples each; Drakenstein, 5 samples; Port, Old Port, Alphen Red Wine, Colonial White Wine, and an unnamed wine, 1 sample each.

The first three Drakensteins analysed all contained formaldehyde; one of these was labelled as "pure natural wine." Although all three Crown Ports complied with the provisions of the law, two contained salicylic acid, but within the legal limit. The two F.C. Pontacs also complied with the requirements of the Act, and so did the four F.C. Sherries. One of the last, it is true, contained a small quantity of formaldehyde, but, as the statutory prohibition of this antiseptic covers only its addition to "pure natural wine," this fact constitutes no infringement of the present law where the article is simply denominated "wine," or where the words "pure natural wine" are not made use of. This remark also applies in the case of one of the four Kimberley Club Sherries, which was likewise found to contain formaldehyde. The samples of Hermitage all complied with the legal requirements, and so did those of Cabernet du Sauvignon, one of the latter being correctly labelled as "pure natural wine." The two "sherries" both contained formaldehyde, and one of the "Colonial red wine" samples had been treated with a considerable portion of salicylic acid, but all the remaining wines in the above list complied with legal provisions, and amongst these the Alphen red wine, one "Colonial red wine," and the "Colonial white wine" were correctly termed "pure natural wines."

In addition to the above analyses of Colonial wines, 26 samples of imported wines were similarly analysed; these are comprised in the list below:—

Sparkling wines: Heidsick, Baron Richard, Pomery and Grens, and Burgeff (Hochheim). *German white wines*: Laubenheimer, Brauneberger, Graacger, and Erdener Treppchen. *Clarets*: Chateau Bellevue-Cordeillan, Chateau de Beychevelle, St. Julien, and Medoc. *Burgundy*: Beauné. *Ports*: Invalid Port, Fine Old Tawny, 79 Port, White Port, Cato Brand, Douro Port, and Hunt's Port. *Sherries*: Dry Sherry and Pale Dry Gonzalez.

All the above were found to be in accord with the provisions of "The Wine, Brandy, Whisky and Spirits Act, 1906."

A sample of Liebfrauenmilch (Rhine Wine) was tested as to its alcohol content, and was found to contain 18·87 per cent. of proof spirit. Three specimens of Mas de la Ville wines proved to be non-alcoholic, and one of Carte Blanche practically so, containing only 1·16 per cent. of proof spirit.

Fairly complete analyses were made of a number of more or less typical Cape wines of definite origin during the course of the year. The samples taken for the purpose were all unfortified, and had been subjected only to ordinary cellar treatment, including sulphuring, and, in a few cases, the addition of tartaric acid and tannin. The official German methods of analysis were used: Tannin was determined by the Neubauer-Löwenthal method; nitrogen by the Kjeldahl process.

These analyses resulted as follows:—

LOCALITY.	Vintage.	Grape	Alcohol, vol. per cent.	Alcohol, grms. per 100 c c	Proof Spirit per cent	Extract, per cent.	Ash, per cent.	*Total Acid, per cent	†Volatile Acid, per mille	Total Tartaric Acid, per cent	Cream of Tartar, per cent	Sugar, per cent	Glycerine, per cent.	Alcohol, Glycerine, ratio 100 to	Tanin, per cent.	Nitrogen. per cent	Proteins, N X 6·25	Sulphur Dioxide mgrms per litre.	Potassium sulphate grms. per litre.	Remarks.
RED WINES.																				
Groot Constantia ...	1906	Cabernet Sauvignon ...	11·91	9·46	20·88	2·277	·264	·534	·660	·236	·296	·093	·755	8·0	·156	·0196	·1225	Nil	·433	
„ „ ...	„	Hermitage ...	11·86	9·42	20·80	2·560	·293	·485	1·032	·180	·193	·112	·743	7·9	·257	·0413	·2581	„	·831	Presswine.
High Constantia ...	„	Hermitage and Cabernet ...	13·08	10·38	22·94	2·165	·248	·470	·690	·191	·240	·094	·836	8·0	·122	·0203	·1269	„	·534	
Somerset West ...	„	Hermitage ...	13·34	10·59	23·37	2·586	·270	·554	1·152	·219	·221	trace	·787	7·4	·149	·0413	·2581	„	·693	Little Cabernet ; soil low, sandy
Vlottenburg ...	„	„ ...	14·60	11·59	25·57	3·616	·317	·655	1·020	·127	·117	·127	·989	8·5	·201	...	...	70	·735	Hill, gravel and sand soil.
„ ...	„	„ ...	12·00	9·52	21·03	2·651	·273	·606	·746	·178	·223	trace	·834	8·7	·166	·0581	·363	50	·507	Vlei, sandy soil.
„ ...	„	„ ...	11·22	8·90	19·69	1·944	·287	·466	1·536	·178	·221	trace	·827	9·3	·170	·0294	·184	61	·600	Sandy soil.
Elsenburg ...	„	„ ...	9·62	7·63	16·86	2·818	·314	·619	1·198	·221	·227	...	·704	9·3	·125	·0469	·293	26	·735	
Schoongezicht ...	„	Cabernet Sauvignon ...	12·88	...	22·87	3·985	·282	·760	2·220	·180	·226	·446	·963	...	·245	...	·241	...	·428	
High Constantia ...	1905	Hermitage and Cabernet ...	12·71	10·09	22·28	2·118	·232	·527	·834	·135	·169	·081	·835	8·3	·121	·016	·100	Nil	...	
Constantia ...	„	Hermitage ...	13·34	10·59	23·37	2·472	·276	·474	·640	·180	·117	·036	·799	7·6	·083	...	...	48	·992	
Vlottenburg ...	„	„ ...	12·59	9·99	22·08	2·681	·347	·635	1·038	·088	·100	·026	·870	8·8	·147	·055	·341	281	·675	Hill slopes, gravel, slaty, sandy
„ ...	„	„ ...	12·44	9·87	21·83	2·872	·358	·753	2·136	·090	·113	·037	·885	8·9	·159	·057	·359	176	·818	Vlei, sandy soil.
„ ...	„	„ ...	12·07	9·58	21·21	2·870	·341	·714	1·122	·118	·136	·083	·992	10·4	·163	·055	·341	120	·832	
Elsenburg ...	„	„ ...	12·13	9·62	21·27	2·262	·252	·616	1·248	·236	·273	trace	·785	8·1	·110	·028	·175	21	·847	
Paarl ...	„	„ ...	12·13	9·62	21·27	2·276	·256	·544	·996	·236	·211	·053	·784	8·1	·130	·027	·171	8	·753	High gravel soil.
High Constantia ...	1904	Hermitage and Cabernet ...	12·98	10·30	22·75	2·228	·232	·516	·744	·168	·188	·082	·919	8·9	·126	·0126	·079	Nil	·598	
Stellenbosch ...	„	Hermitage ...	12·05	9·56	21·11	2·333	·277	·538	1·020	·246	·147	trace	·757	7·9	·132	·0252	·157	„	·750	Low sandy soil.
Constantia ...	„	„ ...	11·80	9·37	20·60	3·030	·225	·599	·926	·300	·216	·039	·702	7·5	·130	...	...	„	·712	
„ ...	1903	„ ...	12·40	9·84	21·73	2·078	·244	·591	·966	·251	·169	·046	·903	9·2	·107	...	...	„	·781	
„ ...	1903	„ ...	12·05	9·56	21·11	2·124	·241	·541	·852	·251	·268	trace	·728	7·7	·093	·0266	·166	„	·762	High gravel soil.
WHITE WINES.																				
Groot Constantia ...	1906	Mixed ...	10·91	8·66	19·11	2·073	·207	·413	·594	·105	·132	...	·732	8·4	·089	·0119	·074	Nil	·524	
Constantia ...	„	Stein ...	14·18	11·25	24·85	2·416	·222	·763	·511	·274	·075	·276	·841	7·5	·052	...	...	138	·921	
„ ...	„	Green Grape ...	12·58	9·98	22·06	2·238	·247	·705	1·521	·242	·052	·253	·715	7·2	·065	·028	·175	120	1·491	High clay soil.
Vlottenburg ...	„	Stein ...	13·22	10·49	23·18	2·903	·238	·734	·864	·238	·085	trace	·863	8·2	·052	·0353	·221	252	·549	Sandy soil.
Elsenburg ...	„	Stein, Green Grape }	13·81	10·95	24·19	2·320	·245	·564	1·260	·169	·169	...	·768	7·0	·045	·0230	·144	95	·756	
„ ...	„	White French ... }	13·43	10·65	23·54	2·011	·214	·496	1·074	·182	·228	...	·843	7·9	·046	·0196	·122	37	·500	
Constantia ...	1905	Stein ...	13·43	10·65	23·54	2·189	·191	·659	·710	·251	·103	·119	·843	7·9	·042	...	...	11	·785	
Vlottenburg ...	„	„ ...	13·38	10·62	23 44	2·398	·266	·701	1·089	·169	·088	·083	·905	8·5	·066	·035	·219	250	·684	Sandy and gravel soil.
„ ...	„	„ ...	13·31	10·56	23·32	2·399	·225	·689	·708	·232	·075	·084	·724	6·9	·059	·035	·219	207	·636	
„ ...	„	„ ...	13·49	10·70	23·65	2·311	·239	·714	1·015	·201	·136	·098	·913	8·6	·066	·033	·204	198	·615	
„ ...	„	„ ...	13·85	10·99	24·26	2·466	·247	·714	1·275	·197	·127	·092	·920	8·4	·068	·020	·127	204	·546	
Stellenbosch ...	„	Green Grape ...	12·31	9·77	21·57	2·387	·195	·697	·471	·375	.080	·082	·756	7·7	·046	...	...	61	·845	
French Hoek ...	„	„ ...	12·58	9·98	22·06	2·354	·249	·599	·712	·272	·094	·140	·642	6·4	·051	·029	·184	79	1·044	High gravel soil.
Paarl ...	1904	Green Grape ...	12·31	9·77	21·57	2·295	·248	·618	1·140	·262	·019	·352	·664	6·8	·043	·029	·179	65	1·683	Low sandy soil.
Constantia ...	1903	Stein ...	11·35	9·01	19·89	1·734	·176	·599	·768	·292	·207	trace	·615	6·8	·055	·010	·062	Nil	·447	Low sandy soil.
Groot Constantia ...	1902	Haanepoot ...	15·49	12·29	27·15	1·883	·182	·583	1·440	·161	·174	...	·824	6·7	·033	·008	·052	„	·422	

* As Tartaric Acid. † As Acetic Acid.

The figures for Tannin and Ash in these wines are summarised below:—

	Tannin.	
	Red Wines.*	White Wines.
Maximum ...	·201	·089
Average ...	·136	·055
Minimum ...	·083	·033

Ash averages.

Red Wines.		White Wines.	
Sulphured.	Unsulphured.	Sulphured.	Unsulphured.
·302	·248	·229	·195

* Omitting the Press Hermitage, No. 2 on the list.

The number of wines examined by Mr. Lewis was too small to permit of many general conclusions being drawn, but the following points may be noted: The heavily sulphured wines contained relatively small proportions of cream of tartar, and the latter decreased with an increase of sulphate; the sulphur dioxide, oxidising to sulphuric acid, displaces tartaric acid from its combinations with the metallic oxides. The low percentage of reducing sugar proves the completeness of the fermentation; out of the thirty-six wines, only three contained over ·2 per cent of sugar. That Cape wines contain small proportions of glycerine is a view that is controverted by the percentages of that constituent found in the course of these investigations; the maximum found was ·992 per cent., the average ·806 per cent., and the minimum ·615 per cent.

The ratio $\frac{\text{glycerine}}{100 \text{ alcohol}}$ varies in Europe from 7 to 14; the analyses of the above wines showed a variation of the ratio from a minimum of 6·4 to a maximum of 10·4, with an average of 8·0. With this may be compared the figures obtained from the analyses of 82 German wines (Fresenius: "Zeitschrift für analytische Chemie," 1900). These were: Minimum, 5·1; maximum, 14·3; average, 8·9. The ratios in the Cape wines vary less, and their average is only 0·9 below that of the German wines.

In the course of his investigations Mr. Lewis examined a sample of Cabernet Sauvignon from the Stellenbosch Division, which yielded the following results:—

Alcohol by Volume	12·88	per cent.
Proof Spirit	22·87	"
Extract...	3·985	"
Ash	·282	"
Total acidity, as Tartaric Acid	·760	"
Volatile Acid, as Acetic Acid	2·220	per mille.
Total Tartaric Acid	·180	per cent.
Cream of Tartar	·226	"
Sugar	·446	"
Glycerine	·963	"
Tannin	·245	"
Proteins	·241	"
Potassium Sulphate	·043	"

Here was a naturally prepared wine that for some unexplained reason was apparently unsound. It still contained unfermented sugar, but, even after making allowance for this, the amount of extract was very high, and it seemed of interest to enquire more fully into the history of the wine. Mannitic fermentation was suspected, and closer investigation was intended, but, although the occurrence was an interesting one, there was no opportunity of investigating the matter further.

It remains to add in connection with the analyses of wines, that sixty-two samples of prize wines, exhibited towards the close of the year at the Wine Show of the Western Province Board of Horticulture, were analysed. The results were published in the *Agricultural Journal* for December, 1907, pages 709 to 711.

None of these wines contained Potassium sulphate in excess of the statutory limit.

(iv) *Analyses of Brandy, Whisky, etc.*—As in the case of wines, a number of preliminary analyses of spirituous liquors were made, in order to gauge the position of such articles relatively to the provisions of the "Wine, Brandy, Whisky and Spirits Act, 1906." In this connection the following Colonial brandies were examined and found to accord with the provisions of the law: 4 F.C. Brandy, 3 "Brandies," 2 Old Montagu Dop.

Several imported brandies and whiskies were also analysed with the same object in view, and the results of their analyses are given below. Nos. 43 to 52 and 79 to 89 are brandies, and Nos. 53 to 78 whiskies, the numbers continuing serially from the list given on page 11 of my report for the year 1906.

43. Sazérac de Forges Fils, 3 star Cognac.
44. Rouillet & Delamain, 3 star Cognac.
45. Consolidated Cognac-Bordeaux Wine Growers Co., J. L. Ruby & Co., 3 star Cognac.
46. Jas. Hennessy, 1 star Cognac.
47. Jas. Hennessy, 3 star Cognac.
48. John Exshaw, Bordeaux, No. 2 brandy.
49. J. & F. Martel, 1 star Cognac.
50. J. & F. Martel, 3 star Cognac.
51. Caton Père et Fils, 3 star Cognac.
52. Maraud Frères, 3 star Cognac.
53. Iona Blend, Old Highland, red seal, G. & J. Maclachlan.
54. Very Old Liqueur, G. & J. Maclachlan.
55. Maclachlan's Castle Brand Famous Highland.
56. Mackie's Greyhound Special Pure Scotch.
57. Mackie's White Horse Cellar.
58. Old blended Glenlivet, James Watson.
59. Mackie's White Horse Cellar.
60. S.S. Small Still Scotch, Neil Roy.
61. Old Gold Scotch, Sanderson & Son.
62. Vat 69, Sanderson & Son.
63. Liqueur Scotch, MacDonald & Co.
64. " " "
65. Loch Ness Blend—fine old Scotch, Robert Christie & Co.
66. King Edward VII., James Buchanan & Co.
67. Canadian Club, Hiram Walker & Sons, Ontario.
68. Fine old Irish, C. & J. Burke.
69. Perfection, special old Scotch, Peter Dawson.
70. Fine old Scotch, John Robertson & Son.
71. " " "
72. Old vatted Glenlivet special reserve, Andrew Usher & Co.
73. Special selected Highland, Whyte & Mackay.
74. Ford's No. 1, Whisky.
75. Shamrock Whisky, Kirker, Greer & Co., Belfast.
76. Rare old Highland Whisky, Duncan & Co.
77. John Begg's Royal Lochnagar Whisky.
78. Old Highland Whisky, John Walker & Sons.
79. Bertineau & Cie., 3 Star Cognac.
80. " " "
81. Lablache & Co.'s Brandy.
82. Lapoire & Co., fine French wine brandy.
83. Bertineau & Cie., 3 star fine Cognac brandy.
84. Jules Romford & Co., 3 star Cognac.
85. Bertineau & Cie., 3 star fine Cognac brandy.
86. D. G. Mortevart & Cie., 3 star Cognac brandy.
87. Lablache & Co., 3 star Cognac.
88. Bertineau & Cie., 3 star fine Cognac brandy.
89. " " " " "

The results of the analyses of these forty-seven brandies and whiskies are as follows :—

No.	Proof Spirit %	Alcohol Volume %	Extract %	Tannin.	Sugar.	In grammes per 100 litres of Absolute Alcohol.						
						Fixed Acid.	Volatile Acid.	Aldehydes.	Furfurol.	Ethers	Higher Alcohols	Total Secondary Constituents.
43	87·0	49·65	1·504	considerable	1·176	9·3	45·3	18·0	1·7	80·9	132	277·9
44	79·5	45·37	·515	little	much	21·15	14·8	2·0	·25	24·3	51	92·35
45	82·7	47·18	·851	little	much	8·0	6·1	3·5	·1	11·2	22	42·9
46	82·6	47·13	·612	much	much	22·3	40·7	12·3	3·2	142·5	163	361·7
47	80·6	46·00	·632	much	much	43·5	48·9	18·4	1·3	128·8	179	376·4
48	87·3	49·81	·930	little	much	15·7	11·4	10·0	·36	24·7	35	81·46
49	87·0	49·65	·642	much	much	28·7	39·9	13·6	1·4	86·9	103	244·8
50	81·0	46·22	·664	much	much	39·2	40·2	20·6	2·6	127·5	118	308·9
51	77·5	44·22	·706	much	much	32·2	17·6	8·7	·37	16·9	36	79·57
52	82·7	47·18	1·707	little	1·466	15·1	9·0	9·1	·12	17·7	39·2	75·12
53	81·8	46·7	·112	little	little	25·2	16·3	10·4	·55	53·5	52	132·75
54	81·8	46·7	·144	fair	little	22·9	23·5	13·8	1·26	31·5	101	171·06
55	83·0	47·4	·070	little	little	15·8	12·6	12·2	1·32	33·4	115	174·5
56	78·4	44·7	·134	fair	little	28·2	21·2	11·8	1·19	49·1	118	201·29
57	102·4	58·4	·181	much	much	24·8	27·3	12·6	1·72	58·2	128	227·82
58	81·2	46·3	·114	much	much	29·2	27·0	11·7	1·53	50·5	110	200·73
59	81·8	46·7	·168	much	much	29·9	25·7	12·6	2·25	67·8	191	299·35
60	82·5	47·1	·043	nil	trace	nil	8·5	5·1	·50	30·9	93	138
61	82·2	46·9	·128	much	much	13·8	24·3	9·6	1·96	54·4	90	180·26
62	80·6	46·0	·125	fair	much	16·6	22·6	10·1	1·48	50·6	92·	176·78
63	84·7	48·3	·078	little	trace	9·4	16·3	11·1	1·72	42·3	106	177·42
64	84·0	47·9	·090	little	trace	7·9	15·1	9·0	1·69	42·3	107	175·09
65	81·4	46·4	·56	trace	much	17·1	10·4	10·8	1·10	28·6	135	185·90
66	80·4	45·9	·122	little	fair	20·4	21·7	17·0	2·36	50·8	193	284·86
67	80·0	45·5	·132	much	fair	28·3	51·8	11·7	1·63	62·9	166	314·03
68	81·4	46·4	·090	trace	fair	9·2	11·4	8·4	1·01	26·8	127	174·61
69	81·0	46·2	·152	little	fair	25·1	28·2	16·0	2·53	56·1	173	275·8
70	82·4	47·0	·074	little	fair	13·3	18·6	10·4	1·56	51·7	138	222·6
71	103·4	59·0	·123	much	fair	41·5	17·9	10·3	2·30	55·4	135	220·9
72	83·2	47·5	·147	little	fair	23·7	15·5	8·6	1·68	53·0	168	246·78
73	80·3	45·8	·103	little	fair	18·2	17·5	9·3	1·82	50·0	209	287·62
74	82·8	47·25	·083	little	fair	11·1	15·2	9·4	2·21	52·8	165	244·61
75	79·5	45·4	·244	little	fair	6·66	19·9	11·1	1·87	45·8	125	203·67
76	82·8	47·25	·098	little	fair	7·5	9·9	6·4	·69	45·2	50	112·19
77	79·9	45·6	·198	little	fair	4·9	19·3	14·0	1·67	47·3	134	216·27
78	79·2	45·2	·111	fair	fair	19·0	27·9	15·1	3·57	80·9	160	287·47
79	77·1	44·0	·73	...	...	...	32·6	8·0	·39	34·7	47·0	122·69
80	78·7	44·9	·76	...	...	...	24·1	10·0	·66	37·0	90	161·76
81	77·4	44·2	·8248	...	...	...	17·7	10·3	·65	125·4	153	307·05
82	101·2	57·8	·9228	...	...	...	23·4	11·5	·7	159·3	159	353·9
83	79·1	45·1	·9370	...	...	...	34·66	7·50	·64	28·12	21	91·92
84	83·8	47·8	·973	...	...	...	17·80	15·30	1·90	153·12	200	388·12
85	80·2	45·8	·77	...	...	...	18·6	3·0	·76	28·16	19	69·52
86	84·9	48·4	·82	...	...	...	14·4	4·5	·88	107·36	133	260·14
87	79·7	45·5	·977	...	...	...	13·44	9·74	·48	88·00	152	263·66
88	80·8	46·1	·776	...	...	...	19·56	9·08	·74	28·16	25	82·54
89	78·7	44·9	·76	...	...	...	24·12	10·0	·66	37·0	90	161·78

Of the first ten articles in the above tables (*i.e.*, Nos. 43 to 52) and the last eleven (*i.e.*, Nos. 79 to 89), all, except Nos. 48, 81 and 82, were labelled "Cognac," a term not mentioned in Act 42 of 1906, but practically equivalent to "pure wine brandy." In the past so-called Cognacs, when found to have been derived from rectified or silent spirit, have been condemned under Act 5 of 1890 as untrue to name.[*]

No. 43 is apparently a genuine Cognac, but contains sugar in excess of the quantity permitted by law.[†] Nos. 44, 45, 51, 52, 79, 80, 83, 85, 88, and 89 are not genuine Cognac, No. 52, moreover, containing sugar in excess of the legal limits. Nos. 46, 47, 49 and 50 appear to be genuine Cognacs, and No. 48 a genuine brandy.[‡] In the whiskies, no adulteration is indicated by the chemical analysis.

In three Colonial brandies the following proportions of spirit were found:—

	Alcohol Volume. %	Proof Spirit. %
Five Star Brandy	47·29	82·88
Three Star Brandy	48·54	85·06
F.C. Brandy	46·70	81·83

Three prize brandies, exhibited at the Western Province Board of Horticulture Show, were analysed. The results were published on page 711 of the *Agricultural Journal*, Vol. 31.

(v) *Analyses of Lime Juice.*—A few determinations made with respect to various classes of lime juice may be here recorded. A sample of C. and E. Morton's Fortified Lime Juice was found to contain 14·35 per cent. of proof spirit, and one of "Fortified Navy Lime Juice" contained 15·56 per cent. of proof spirit. The same proportion was found in Rose and Co.'s Fortified Lime Juice, but a sample of Montserrat Lime Fruit Juice proved to be free from spirit.

(vi) *Analyses of Bush Tea.*—A reference to one of the articles usually known in this Colony under the name of "Bush Tea" was made in my report for the year 1904 (G. 66—1905, p. 21). Two determinations were recently made of the amount of extract yielded by boiling samples of Cyclopia "tea" under a reflux condenser for one hour. In the one case the crude article was thus treated, and yielded an extract percentage of 18·84. A sample of "refined tea," *i.e.*, with the coarser and more woody portions removed, gave 33·10 per cent. of extract, the refining process naturally bringing about a great increase of extractive matter, and, in so far, an improvement upon the original crude article, which is also thus rendered much finer by disintegration, and in a more suitable condition for the use intended. The proportion of extract yielded by the refined "tea" does not differ greatly in amount from that in many real teas. It is, however, well known that *Cyclopia genistoides*, Vent., the plant from which this "bush tea" is prepared, does not contain any thein, the alkaloid of the tea plant. This bush tea is nevertheless used by many who find ordinary tea to disagree with their constitution, and no doubt for such it furnishes a healthy and welcome substitute. Another sample of "bush tea," subsequently analysed, and derived from a different plant, when extracted by the same process as above, yielded an extract amounting to 22·60 per cent.

(vii) *Analyses of Meal.*—The following results were obtained by analysis of an article called "Mealina." For comparison, the figures arrived at by analysing American and Colonial meal are appended:—

	Moisture.	Ash.	Proteins.	Crude Fibre.	Carbohydrates.
Mealina	8·81	1·28	8·50	·81	80·60
American	10·90	·92	13·22	·92	70·04
Colonial	10·64	1·32	12·97	1·62	73·45

The "Mealina," it will be seen, is much the poorest in proteins, and contains more carbohydrates.

(viii) *Analyses of Jam.*—Six tins of Australian jams, imported at Port Elizabeth, were submitted for analysis. All these tins were more or less blown, and two—a plum jam from Hobart, Tasmania, and a gooseberry jam bearing the label of the "Australian Preserve Combine"—were analysed. The former was found to contain 4·2 and the latter 2·7 grains of tin per pound.

(ix) *Cream Powder.*—An article called "Cream powder" was found to consist of alumina, lime, carbonates, phosphates and sulphates; it was represented to be a substitute for cream of tartar.

III. AGRICULTURAL ANALYSES.

(i) *Analyses of Soils.*—It is gratifying to be able to report, after so many years of lamentation over the stoppage of the systematic investigation of the Colony's soils, that there seems at length to be some reasonable prospect of the work being resumed; indeed, in one sense, it may be said to have been already recommenced, as the sequel will show.

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[*] In illustration hereof see page 17 of my report for 1905.

[†] A sample of Sazeracs ***** Cognac subsequently examined was found to be free from sugar.

[‡] As at present statutorily defined.

Sixty-nine samples of soil from different parts of the country have been under examination during last year, as compared with 14 in 1906, and 54 in 1905; a number far from adequate, and yet promising, as indicating a turn of the tide.

Robertson Division.—The most important piece of work of this kind undertaken during the year now under report was the investigation of the soils of the Government Experiment Station at Robertson.

The soils were collected from four spots, distinguished by the letters A, B, C and D, within the grounds of the Experiment Station, and represent three types of soil, D being strictly regarded, not an independent type, but merely a patch in the area denoted by B.

The first of these four is a red-coloured light sandy loam, resting upon a denser and more clayey subsoil, over twenty feet in depth. This soil has a tendency towards alkalinity in parts. B is another red sandy loam of considerable depth, overlying a subsoil similar to that of A. The third type of soil at the station is that whereof C is a sample. It is a grey calcareous loam, with a subsoil of almost white appearance. In this soil "brack" water is said to be met with a short distance below the surface. D represents an alkaline patch in the area covered by the soil whereof B is a type.

In each case the soil was collected in sections, representing successive layers of eight inches depth each, down to a total depth of four feet, so that A1, B1, C1, and D1 are representative of the surface soil to a depth of eight inches, A2, B2, C2, and D2 represent soil from eight to sixteen inches in depth, and so on.

The four surface soils were chemically analysed, as to their proportions of plant food, by the standard method commonly employed in the Government Analytical Laboratories, with the following results:—

No.	Percentage of Field sample.	Percentage of Soil sifted through 1mm. Sieve.				Percentage of soil sifted through ½ mm. Sieve.		
	Fine Earth.	Water.	Organic Matter.	Chlorine.	Nitrogen.	Lime.	Potash.	Phosphoric Oxide.
A	90·4	·97	2·59	·0184	·084	·207	·095	·036
B	90·0	·95	2·98	·0099	·070	·276	·091	·033
C	89·2	1·97	4·72	·0248	·154	·461	·179	·042
D	75·0	2·85	3·35	·5489	·056	·078	·129	·040

Additional extractions of other portions of these four soils were made, for the purpose of comparing the results, by Hilgard's method, by Dyer's method, and by pure distilled water. Hilgard's method is identical with that generally used in the Government Laboratories, except that the soil is extracted with Hydrochloric Acid for five days on a steam bath, instead of at the ordinary temperature. Dyer's method is that of extraction with a one per cent. citric acid solution for seven days. In the soil extracts obtained by Dyer's method, determination of lime, potash and phosphoric oxide were made, in those obtained by Hilgard's method lime and potash were determined, and in the aqueous extract (applied in the case of soil D only) lime alone was estimated. The results thus arrived at are appended:—

Hilgard's Method.

Percentage of Soil sifted through ½mm. sieve.

No.	Lime.	Potash.
A.	·200	·492
B.	·312	·447
C.	·510	·677
D.	·072	·833

It is obvious that, with regard to lime, Hilgard's method extracted practically no greater quantities than those extracted by the standard method; in fact, it may be said that in the case of A, and also D (which was a patch in the area represented by B), the proportions extracted were really identical. Apparently, in such cases, the extraction at the lower temperature was quite sufficient to remove the entire reserve stock of lime, using the word "remove" as Prof. Hilgard uses it. The lime, it must be noted, occurs here largely as carbonate.

As far as concerns potash, the quantities extracted by Hilgard's method were, in soils A and B, about five times those removed by the standard method, and in C nearly four times as much, while from the brack soil, D, Hilgard's method took out nearly seven times as much potash as the ordinarily adopted method removed.

From the results with regard to potash, obtained by Hilgard's method, one might infer that the soil was very well supplied with potash in an available form, but the practical experiments with cereals on the farm, showing, as they do, that to supply the soil with phosphates is unavailing, unless potash be also given, indicate that, although phosphatic fertilisers may increase the stock of *phosphates* up to the limits of adequacy, yet the law of the minimum still operates in respect to potash. It also illustrates my previously expressed view that in this Colony results arrived at by Hilgard's method (*i.e.*, by steam temperature extraction) rather overstate the stock of available plant food in the soil.

By Dyer's method the following results were arrived at:—

	Percentage of Soil sifted through 3mm. sieve.		
No.	Lime.	Potash.	Phosphoric oxide.
A.	·213	·025	·0028
B.	·310	·032	·0045
C.	·396	·040	·0069
D.	·072	·021	·0007

Here it will be seen that C, which proved the best of the four soils when examined by Hilgard's or by the standard method, also turned out the best when extracted by Dyer's method. But all four soils are lacking in reserve of phosphates when judged on the basis of the standard method, and in immediately available phosphates on the basis of Dyer's method. The last-mentioned method extracted from one-sixth to one-third as much potash, and from one-sixth to one-twelfth as much phosphoric oxide, as the standard method. The lime extracted by Dyer's method was practically the same as that taken out by the standard method; indeed, strange though it may seem at first sight, in two cases, A and B, the citric acid method extracted slightly more lime than the cold hydrochloric acid method. This is explained by the fact that the lime in the soil consists chiefly of carbonate, and so dissolves readily in either acid, and that the soil sifted through the 3 mm. sieve, for the purpose of Dyer's method, would contain a larger proportion of the coarser grades than the ½ mm. product used for the standard method, and hence more calcium carbonate, since the coarser particles in this case consisted almost wholly of that material.

Sample D, sifted through a 3 mm. sieve, and extracted with pure distilled water, yielded ·0444 per cent. of lime, not much more than half the proportion furnished by Dyer's method.

As stated above, only the four surface soils were examined in respect of the proportions of plant food contained, but mechanical analyses were conducted in the case of all six of the eight-inch sections representing the profile of each of the four soils down to the depth of four feet. Thus the following results were arrived at:—

No.	Soil class.	Percentage of dried soil.									
		Pebbles > 3 mm.	Coarse gravel 3 – 2mm	Fine gravel 2 – 1mm.	Coarse sand 1 – ·5 mm.	Medium sand ·5 – ·25 mm.	Fine sand ·25 – ·1 mm.	Very fine sand ·1 – ·05 mm.	Silt ·05 – ·01 mm.	Fine silt ·01 – ·005 mm.	Clay < ·005 mm.
A1	Sandy loam ...	·15	·21	·94	8·44	10·99	40·40	11·45	9·87	8·88	8·67
A2	" ...	·12	·27	·84	13·13	13·74	33·80	11·77	7·95	9·55	8·83
A3	" ...	2·26	·83	1·06	11·66	12·13	29·59	9·09	6·17	7·51	19·70
A4	Loam ...	·54	·37	·63	7·38	8·17	26·58	13·69	9·13	10·76	22·75
A5	" ...	1·08	·27	·58	6·32	6·98	21·99	13·65	13·36	15·61	20·16
A6	" ...	·09	·06	·39	5·73	5·54	24·16	7·47	19·91	16·91	19·74
B1	Fine sandy loam	·68	·22	·92	8·21	9·65	51·88	8·29	7·51	6·28	6·36
B2	Sandy loam ...	·07	·13	·62	12·70	9·50	38·70	8·54	9·95	11·09	8·70
B3	Sandy clay ...	·04	·09	·66	13·22	8·95	32·99	7·82	7·30	8·01	20·92
B4	" ...	·01	·08	·50	11·37	7·83	30·09	5·74	4·98	8·73	30·67
B5	" ...	·18	·21	·61	11·30	7·59	28·96	6·25	7·59	7·46	29·85
B6	" ...	·15	·13	·61	11·93	8·29	28·72	6·75	7·83	7·97	27·62
C1	Sandy loam ...	·11	·22	·79	9·89	12·33	29·36	9·77	10·46	14·47	12·60
C2	" ...	·09	·21	1·00	11·49	10·47	35·05	6·69	9·44	11·40	14·16
C3	" ...	·24	·16	·85	10·47	8·98	28·73	7·05	14·90	14·74	13·88
C4	Fine sandy loam	2·82	1·46	2·11	8·83	8·36	26·74	4·41	11·41	25·87	7·99
C5	"	3·80	·81	1·28	5·55	6·21	27·04	6·17	16·59	23·85	8·70
C6	"	15·35	·92	1·72	4·23	6·24	21·58	8·23	15·06	23·70	2·97
D1	Sandy clay ...	15·04	1·49	2·00	6·76	6·34	31·50	7·37	5·24	4·73	19·53
D2	" ...	3·81	·85	1·73	8·85	7·83	34·22	5·57	3·71	4·20	29·23
D3	" ...	4·90	1·21	1·64	7·15	9·42	33·72	7·84	3·48	4·13	26·51
D4	" ...	·77	1·03	2·08	2·87	10·34	38·41	8·50	4·05	4·57	27·38
D5	" ...	·72	·76	1·98	2·82	10·30	35·26	7·77	3·20	4·57	32·62
D6	" ...	·94	1·19	2·15	2·96	9·16	34·07	8·29	4·27	4·53	32·44

The results detailed in the foregoing table may be summarised as follows :—

No.	Pebbles > 3 mm.	Gravel 3 – 1 mm.	Sand 1 – ·05 mm.	Silt ·05 – ·005 mm.	Clay < ·005 mm.
A1	·15	1·15	71·28	18·75	8·67
A2	·12	1·11	72·64	17·50	8·83
A3	2·26	1·89	62·47	13·68	19·70
A4	·54	1·00	55·82	19·89	22·75
A5	1·08	·85	48·94	28·97	20·16
A6	·09	·45	42·90	36·82	19·74
B1	·68	1·14	78·03	13·79	6·36
B2	·07	·75	69·44	21·04	8·70
B3	·04	·75	62·98	15·31	20·92
B4	·01	·58	55·03	13·71	30·67
B5	·18	·82	54·10	15·05	29·85
B6	·15	·74	55·69	15·80	27·62
C1	·11	1·01	61·35	24·93	12·60
C2	·09	1·21	63·70	20·84	14·16
C3	·24	1·01	55·23	29·64	13·88
C4	2·82	3·57	48·34	37·28	7·99
C5	3·80	2·09	44·97	40·44	8·70
C6	15·35	2·64	40·28	38·76	2·97
D1	15·04	3·49	51·97	9·97	19·53
D2	3·81	2·58	56·47	7·91	29·23
D3	4·90	2·85	58·13	7·61	26·51
D4	·77	3·11	60·12	8·62	27·38
D5	·72	2·74	56·15	7·77	32·62
D6	·94	3·34	54·48	8·80	32·44

It will be observed that, in the case of the alkaline patch D, which is also chemically the poorest in plant food, the surface soil contains much less silt than the others, whereas C, the soil best supplied with the plant food, is likewise the richest in silt. Taking silt and clay together, D contains in the upper eight inches 29·50 per cent., while C contains 37·53, A contains 27·42, and B 20·15 per cent.

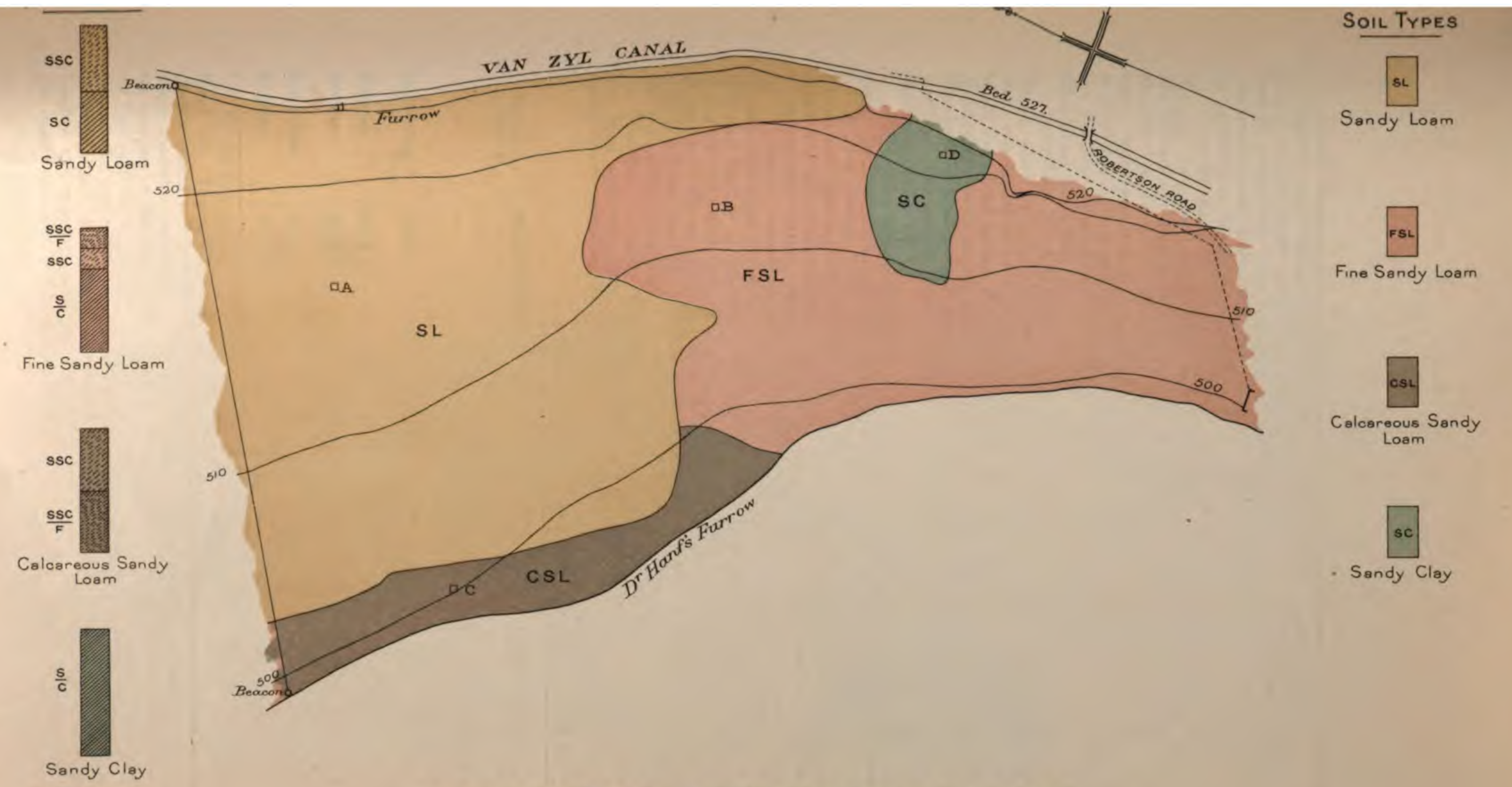
At the spot D a number of additional (three-inch section) samples were taken from the two feet of soil nearest the surface, so as to allow of a more complete investigation into the vertical distribution of alkaline salts in the soil being made than would have been possible had only eight-inch sections being collected. The eight samples of three-inch sections each, numbered D7 to D14, therefore represent the first two feet of soil in the following table, the third and fourth foot being represented sufficiently by samples D4, D5 and D6.

The six samples already mentioned as having been taken at the spot A were also partially examined with regard to the water-soluble salts present. From these two sets of soils the following percentage results were obtained:—

No.	Sodium chloride.	Sodium sulphate.	Sodium carbonate.	Total alkaline salts.	Calcium sulphate.	Calcium carbonate.	Magnesium sulphate.	Magnesium carbonate.	Total soluble salts.	
									Calculated.	Found.
A 1	·024	...	...	...	...	...	...	...	...	·060
A 2	·018	...	...	...	...	...	...	...	...	·044
A 3	·010	...	...	...	...	...	...	...	...	·070
A 4	·011	...	...	...	...	...	...	...	...	·062
A 5	·011	...	...	...	...	...	...	...	...	·056
A 6	·019	...	...		...	...	...	...	...	·080
D 7	1·029	·162	Nil	1·191	·112	·020	·043	Nil	1·366	1·400
D 8	·942	·114	Nil	1·056	·088	·020	·071	Nil	1·235	1·272
D 9	·662	·037	Nil	·699	Nil	·037	·067	·003	·806	·858
D 10	·516	·071	Nil	·587	Nil	·029	·041	·018	·675	·700
D 11	·487	·082	Nil	·569	Nil	·024	·014	·027	·634	·674
D 12	·409	·082	Nil	·491	Nil	·018	·014	·030	·553	·572
D 13	·342	·062	Nil	·404	Nil	·016	·014	·005	·439	·504
D 14	·301	·067	Nil	·368	Nil	·014	·007	·005	·394	·450
D 4	·291	·066	Nil	·357	Nil	·009	·012	·011	·389	·428
D 5	·307	·073	Nil	·380	Nil	·012	·012	Nil	·404	·476
D 6	·321	·076	Nil	·397	Nil	·007	·012	·004	·420	·496

In the case of A there was no necessity to push the investigation further, the total soluble salts being considerably below the danger limit. At D a very different condition of things exists.

Appended to this will be found a diagram showing, approximately, the distribution of the various types of soil at the Experiment Station; this diagram will illustrate at the same time the way in which it is hoped larger areas will hereafter be illustrated in respect of the composition of their soils,



EXPLANATION
SC Loam
SSC Sandy Loam
S/C Sandy Clay
F Fine

ROBERTSON EXPERIMENT STATION.

Scale 1 Inch = 320 Feet.

100 0 100 200 300 400 500 600 700

Chas. F. Juritz
3rd April 1908.

Prieska Division.—An investigation was also made in connection with the soils of farms in the Prieska Division bordering on the Orange River, and subjected, in part, to the deposit of silt from that river when in flood. This investigation, it may be incidentally remarked, is of all the greater interest in view of the Kakamas settlements lower down the river. An account of the results arrived at will shortly be published in the *Agricultural Journal.*

Cape Division.—In a paper read by me before the South African Philosophical Society some months ago,* when referring to the soils derived from the rocks of the Malmesbury geological series, regret was expressed that there were no analyses available, conducted by the standard method in use in the Government Laboratories, with respect to soils collected within the Malmesbury Division itself; and to illustrate the composition of Malmesbury series soils, examples were taken from the Paarl and Stellenbosch Divisions, where such soils were found to be poor in all mineral plant food.

Since then Mr. J. G. Rose, of the Analytical Staff, has visited the farm Hooge Kraal, about 5½ miles north-west of Durbanville, and collected for analysis soils from two localities, as representing some of the choicest lands in those districts, which have been termed the granary of the Colony. Although not situated in the Malmesbury Division, the farm is well known as one of the Koeberg farms, and is, therefore, in some respects, representative of the grain lands of that portion of the country. The results of the analyses of these soils are being published in the *Agricultural Journal.*

Van Wyk's Vlei.—Analyses of the soils affected by brak in this vicinity were made: the results will be found on pp. 51 aod 52 of the Director of Irrigation's report.

Karroo Purple Shales.—In many parts of the Karroo alternating beds of purple and greenish-coloured shales are to be seen. Of the Beaufort geological series, and more particularly of the Burghersdorp beds in that series, they constitute a characteristic feature. Bands of dark purple mudstones and shales may be noticed by any railway traveller through those parts of the country where the rocks of the Beaufort series are exposed at the surface—for instance, between Naauwpoort Junction and Ludlow on the Midland Railways. Reference to these mudstones and shales may be found, *inter alia*, on pages 33 and 174 of the Geological Commission's Report for 1903, on pages 77, 78 and 81 of the Commission's Report for 1904, and page 98 of that for 1905. The analytical results arrived at are being published in the *Agricultural Journal.*

Miscellaneous Soils.—The following soils from various parts of the Colony have also been analysed during the year:—

Division or District	Farm or Locality.	Percentage in original soil.	Percentage in soil sifted through 1mm. sieve.				Percentage in soil sifted through ½mm. sieve.		
		Fine earth below ½mm.	Water.	Organic Matter.	Chlorine.	Nitrogen.	Lime.	Potash.	Phosphoric Oxide.
Elliot—Slang River	Lutha	97·67	8·20	19·67	·0187	·263	·482	·153	·110
„ „ ...	„	90·77	3·31	10·60	·0057	·170	·154	·111	·088
Mafeking ...	Hartebeestelaagte	75·20	1·78	4·53	·0007	·042	·036	·048	·056
Herbert ...	Backhouse ...	96·14	1·79	3·24	·0566	·049	·174	·061	·058
„ ...	Douglas ...	99·03	1·80	3·76	·0707	·042	·552	·103	·105
„ ...	„ ...	87·88	3·00	6·01	·0283	·098	2·128	·053	·070
Barkly West ...	Koopmansfontein	91·3	2·51	8·20	·0028	·094	3·338	·125	·066
Mafeking ...	West Hill ...	78·53	·93	2·99	·0025	·056	·064	·056	·041

Of the two Lutha soils, the first represented a black valley soil, and the second a red soil. The surface soil in the valleys is usually black, with a potclay subsoil; on the hillsides it is either light and sandy or deep red, according as the ledges above consist of sandstone or ironstone. In my annual report for 1901, page 23, an analysis of this fine hillside sandy soil (erroneously ascribed to Cala) is given. As that analysis would serve to indicate, in practical experience this soil has been found to be very poor; indeed, I predicted, at the time the analysis was made, that it would stand in need of all-round manuring. The two soils, from the same locality, now reported on are, chemically, very much better. The deep red soil has the local reputation of being the best; chemically it is not as good as the black valley soil, but there are difficulties of environment in the way of successfully cultivating the latter, an illustration of the need of supplementing the results of chemical analysis of a soil by information as to its physical character and other local circumstances ere the probable fertility of the soil can be pronounced upon.

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* "The fertility of some Colonial soils, as influenced by geological conditions."—*Trans. S.A. Phil. Soc.*, vol. xviii, part 1, pp. 7–30.

The Hartebeestelaagte soil was taken at about two feet from the surface, the underlying rock being granitic. It was intended to plant several hundreds of fruit and ornamental trees at this spot. The soil was rather coarse-grained and chemically very poor all round; it was apparently taken from the sand and surface quartzite deposits, which cover an immense part of that District, and on which the farm lies.

The three Herbert soils represent the irrigable area below the Douglas Irrigation Works. The first of these was taken from the farm Backhouse, near the main canal, at 4 miles 30 chains; the second, from the middle of Agricultural Erf No. 5, fairly represents all erven lying along the river bank. These two samples were taken from lands that had never yet been under cultivation. The third soil was fairly representative of all erven along the route of the Main Canal, and was taken near the canal, at 6 miles 10 chains, from Agricultural Erf No. 36. In each case the samples represented the surface soil down to a depth of 12 inches, and each sample was obtained by digging a large hole, leaving a core of soil 12 in. square in the middle. Over this an inverted box 12 in. deep was slipped, and by means of a spade the box, with the contained cube of soil, was then removed, and the lid placed on. The immediately available potash and phosphoric oxide were also determined in these three soils by treating portions of the soil sifted through a 3 mm. sieve with a 1 per cent. citric acid solution (Dyer's method).

The following percentage results were thus obtained:—

Soil.	Potash.	Phosphoric oxide.
1	·010	·016
2	·018	·037
3	·009	·008

These results show the soils to be fairly supplied according to the limits of fertility suggested by Dr. Dyer, viz., ·005 per cent. of potash and ·010 of phosphoric oxide. At the same time, the reserve stock of potash and phosphoric oxide is not high in the first and last of the three soils.

The proportions per cent. of soluble alkali in these three Herbert soils (according to the method employed in connection with the Robertson and Van Wyk's Vlei soils, see pages 100 and 101, were :—

	1	2	3
Total soluble salts...	·048	·060	·056
Sodium chloride	·006	·005	·006
Sodium sulphate	nil	·002	·003
Sodium carbonate	nil	nil	nil
Total alkaline salts	·006	·007	·009
Calcium carbonate	·028	·038	·035
Calcium sulphate	·021	·001	nil
Magnesium carbonate	nil	nil	·003

The proportions of alkali are quite within safe limits in these surface soils; there were, however, no opportunities of ascertaining whether those safe limits were not exceeded in the lower strata of soil.

At Koopmansfontein, whence a sample of soil was taken for analysis, "lamziekte" prevailed amongst the stock. This sample had been taken from flat country abounding in Vaal Bosch, sour Karree, a sort of Ganna bush, reeds and long grass, and fairly represented the general grazing ground. The ground was of a rocky nature, and loose pieces of limestone lay strewn over its surface. The actual sample was collected from a slight depression in a sandy part between the bushes, but even there the soil was shallow, with a gravelly subsoil, and soon the bedrock is reached. This subsoil was regarded as inferior to the soil from the vleis, and was apparently a mixture of sand with what the farmers call "rooi grond."*
It had never been manured or cropped.

The last soil tabulated on page 101, like the third, was rather coarsely grained, and also resembled that soil in its all-round poverty in plant food. It was taken at West Hill, 25 miles N.E. of Maribogo Railway Station, from lands which it had been proposed to bring under cultivation and utilise for the growing of lucerne.

(ii) *Analyses of Fertilisers.*—Scarcely any analyses of fertilisers have been made during the year. It is anticipated, however, that when the "Fertilisers, Farm Foods, Seeds, and Pest Remedies Act" (No. 20 of 1907) comes into active operation, these analyses will more than regain the position of importance they once occupied in the annual record of the Laboratories' work.

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* See also analyses of Prieska soils, mentioned on page 101.

Two samples of *phosphatic rock* were found to contain respectively 34·4 and 27·5 per cent. of phosphoric pentoxide; the former of these contained lime to the extent of 44·6 per cent. Three other samples, received at a later date, did not yield more than from ·1 to ·3 per cent. of phosphoric oxide.

Three average samples of *guano*, representing the season's supply, were selected at the Government Guano Stores by a member of my Staff. Each of these was separately sifted through a 1 mm. sieve, and yielded respectively 91·65 per cent., 90·18 per cent., and 92·66 per cent. of fine material. The sifted portions were then mixed together, and an average sample taken for analysis, yielding the following results:—

	%
Lime	12·54
Potash	2·04
Nitrogen	12·60
Total Phosphoric Oxide	11·88
Phosphoric Oxide, soluble in water	4·14
Phosphoric Oxide, soluble in Citrate solution	11·44

(iii) *Analyses of Sheep and Cattle Dips.*—Comparatively few of these were examined last year. A sample of *Quibell's Sheep Dip* was found to contain 23·0 per cent. of arsenic, calculated as trioxide, and two of "*Quibell's Powder*" yielded, respectively, 22·5 per cent. and 22·3 per cent. of arsenic, calculated on the same basis. A *Lime and Sulphur Dip*, of local manufacture, contained only 2·7 per cent. of lime and 4·9 per cent. of sulphur, results considerably below those furnished by the better class dips of this year. An article known as *Snowdol Sheep Dip*—"*Springbok brand*," was examined, and yielded 12·5 per cent. of phenols; it gave a uniform mixture with water.

I should here state that the article twice referred to on page 24 of my last Annual Report as "*McDougall's Lion Brand Tobacco Extract*" was not, as I now understand, a sample of the original Tobacco Extract, which is also at present sold under that name, but was merely an experimental mixture, to which both arsenic and nicotine had been added as ingredients. It is understood that the Tobacco Extract, as at present on the market, contains no arsenic whatever.

A question of some importance arose in connection with losses of cattle, consequent upon dipping with *arsenite of soda* solution. After the cattle which were fatally affected had passed through the dipping tank, the mixture remaining in the latter was thoroughly stirred, and a sample thereof was taken for analysis; a sample of the actual arsenite of soda used in the preparation of the mixture was also analysed. The printed instructions prescribed a mixture of *five* pounds of arsenite of soda in 100 gallons of water. Upon the basis of an arsenite of soda previously examined in this Laboratory (and containing 64·45 per cent. of arsenic trioxide), such a mixture should contain ·322 per cent. of arsenic trioxide when ready for dipping cattle.

The mixture found in the tank after the cattle had passed through was, however, found to contain ·524 per cent. of the trioxide, which would correspond to a mixture of *eight* pounds of arsenite of the above-mentioned quality to 100 gallons of water.

Upon analysis of the arsenite actually used in this particular case, it was found to be weaker than that on which the foregoing calculation is based, containing in fact only 49·90 per cent. of the trioxide, so that a trifle over TEN pounds of this arsenite must have been added to the 100 gallons of water in order to produce such a mixture as was subsequently found in the tank. The inference, therefore, was that double the proper quantity of arsenite of soda had been used to make up the mixture which resulted in the death of the cattle.

This incident is mentioned, in view of the complaints so frequently made regarding inefficiency of chemicals used in agricultural operations, to emphasise the necessity of due care in carrying out official directions.

A sample of arsenite, subsequently examined, contained 68·7 per cent. of arsenic trioxide.

In two samples of *Cooper's Dip*, received in original packets, the total amounts of arsenic present were determined. In one of these 22·56 per cent. was found, in the other 22·06, agreeing very closely with the average of all the dips of this make analysed in the Government Laboratories between the years 1892 and 1901, which average is 22·4 per cent.

(iv) *Analyses of Castor Oil Beans.*—Four samples of Castor Oil Beans, grown in the Colony, were examined, with the results stated below. The seeds were in each case weighed, the shells removed, the interior portion bruised and extracted with ether for twelve hours in a Soxhlet's apparatus:—

	Ricinus sanguinius.	Ricinus minor.	Ricinus Zanzibariensis.	Ricinus major.
Weight in grammes of 100 beans	46	10·8	75·3	40·2
Per cent. of oil in beans ...	46·2	41·9	39·9	36·0

(v) *Analyses of Fodders.*—Specimens of "Vlei grass," from the vicinity of Mulder's Vlei, and of mealies and mealie-cob were examined, with a view to comparison with ordinary dried fodder. The analytical results will appear in the *Agricultural Journal*.

(vi) *Various Analyses.*—Some specimens of "*Prickly Pear Soap*" were stated to have been prepared from the prickly pear, in conjunction with tallow; these were undoubtedly soap, but of inferior quality. No information was given as to the mode of preparation of the article, but it seemed possible that the ash of the prickly pear had been thus employed. There is obviously no reason why that plant should not do as well for such a purpose as any other plant ash which contains a sufficient proportion of alkaline carbonates. The samples submitted contained rather much alkali, and the ingredients had not been thoroughly mixed; these points, however, could, of course, be easily remedied.

A specimen of *Sugar Beet*, from Caledon, was analysed, and found to contain 17·77 per cent. of sugar. This should be compared with the figures given on page 25 of my last annual report.

A sample of *Insecticide*, X L All brand, was found to be free from metallic and other poisonous components, the active ingredient being of a resinous nature.

IV. MINERAL ANALYSES.

(i) *Gold Assays.*—These still occupy, numerically at least, the first place in the mineral section of the Laboratories' work, some 70 samples having been tested for gold during the year. Of these, three from Laingsburg, two each from Aliwal North, Prieska and Robertson, and one each from Somerset West, Caledon, Elliot, Ladismith, Henning, Bizana, and Albany showed no trace of gold.

Two further specimens of rock from Robertson and one from Worcester contained small traces of gold. Very faint traces of gold were also found in a sample from Heidelberg, in the Swellendam Division, and in one from Wodehouse. A small trace was found in a rock from Vryburg. A sample from Uitenhage Division yielded 17 grains of gold and 4 dwts. of silver per ton.

Several additional rock specimens from the Mafeking District were analysed in 1907, bringing the total number of samples from that area examined during the last three years to 40.* The additional results now recorded are as follows:—

Sample.	Yield of gold per ton.		
	oz.	dwt.	grs.
No. 31	...	5	...
,, 32	...	7	9
,, 33	...	4	5
,, 34	1	2	...
,, 35	1	14	5
,, 36	1	17	17
,, 37	1	1	14
,, 38	1	14	...
,, 39	...	16	12
,, 40	1	7	7
,, 41	No gold.		
,, 42	...	13	12
,, 43	...	7	5
,, 44	...	2	9
No. 45	...	3	21
,, 46	...	...	12
,, 47	...	1	11
,, 48	Traces of gold.		
,, 49	...	...	12
,, 50	Traces of gold.		
,, 51	...	1	...
,, 52	...	...	12
,, 53	...	2	...
,, 54	1	14	...
,, 55	1	7	...
,, 56	...	...	5
,, 57	Faint trace of gold.		

Six samples of rock from Bechuanaland were also analysed, with the following results:—

Sample.	Yield of gold per ton.		
	oz.	dwt.	grs.
1	6	2	12
2	...	...	3
3	Faint trace of gold		
4	No gold.		
5	...	3	18
6	No gold.		

(ii) *Analyses of Copper Ore.*—Next to gold, more labour appears to have been expended in searching for copper than any other metal in various parts of the Colony.

Portions of a copper deposit, of apparently very promising nature, were received from East London, the proportion of that metal present being 11·8 per cent.

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* See page 26 of my Annual Report for 1906.

The copper was present in the form of malachite or carbonate of copper, but the extent or value of such a deposit can, of course, not be gauged by the analysis of a single hand specimen, taken evidently from the surface or from a very slight depth. At a later date, another sample, of similar appearance and character, from the same locality, yielded copper in the proportion of 9·8 per cent.

Three copper ores from Namaqualand were found to contain, respectively, 10·4, 20·0, and 7·9 per cent. of copper. Another from the same district contained 6·65 per cent. of copper, together with traces of zinc and gold.

In a specimen from Vryburg copper was found, as carbonate, to the extent of 37 per cent., and in another specimen, the locality whereof was not ascertained, the proportion of copper present was 28·6 per cent. A rock from Kenhardt proved to contain 1·3 per cent. of copper, and one from Aliwal North 2·52 per cent.

An additional sample from Mount Ayliff[*] showed the following results per cent.:—

Copper	11·4
Nickel	7·6
Cobalt	traces.

Some samples of copper ore from the Cathcart Division were also analysed. One, a picked specimen, yielded 23·98 per cent. of copper; a rough average sample contained 12·55 per cent. Traces of Manganese were also present.

From Nieuwoudtsville a specimen of copper glance, with a little peacock copper ore, was received, bearing copper in the proportion of 23·2 per cent. Sandstones, studded here and there with specks of malachite, submitted from the Tarka Division, seemed to suggest the desirability of further search in that locality. The suggestion was acted on, and at a later date a quartz reef, containing malachite and copper pyrites, and some further specimens of sandstone containing malachite and azurite, were received. The former of these contained 5·8 and the latter 8·2 per cent. of copper. These specimens appeared to hold out hopes of a copper deposit in the neighbourhood, although not in themselves partaking of the nature of a copper lode.

Copper was also tested for in rock samples from Barkly East, Elliot, Steynsburg, and in others from Namaqualand, Aliwal North, East London and Blaney, but without success. Copper stains were, however, found to exist on a sample of rock from Lady Frere, and green patches of malachite (basic carbonate of copper) in a specimen received from Humansdorp.

One sample, which had been definitely pronounced elsewhere to be malachite, was, when examined in this Laboratory, found to contain, *inter alia*, linseed oil—it was nothing more than a lump of dried green paint.

(iii) *Analyses of Manganese Ore.*—In connection with Manganese, as with copper, more activity was manifested than during the preceding year. In one Manganese ore 1·6 per cent. of phosphoric oxide was present; in a second 41·3 per cent. of manganese (calculated as the metal) was found; in another there was 25·9 per cent. of manganese; yet another contained 12·5 per cent., calculated, as in the former instances, as metallic manganese.

Two samples of impure manganese ores, mixed with sandstone, were, like the others above mentioned, received from the Caledon Division. At a later date, the following analysis was made of a sample from the same neighbourhood:—

Manganese calculated as metal	47·52 per cent.
" " " sesquioxide	66·61 " "
Silica and gangue	2·10 " "
Oxide of iron and alumina	7·68 " "
Phosphoric oxide...	1·22 " "
Barium oxide	2·68 " "
Sulphur	trace.

(iv) *Analyses of Coal.*—Only three specimens that could properly be termed coal were analysed during the year; one of these was submitted from Cala, the second represented the coal of the South African Collieries, Dundee, and the third was submitted simply as a "Natal coal." Their analyses are given below:—

	Moisture.	Ash.	Volatile Matter.	Fixed Carbon.	Sulphur.
Cala	3·56	19·87	5·72	70·85	...
Dundee	1·67	9·73	19·40	70·87	2·58
Natal	1·08	12·22	9·84	64·16	2·70

The Cala coal was anthracitic, and apparently better adapted for use in stationary than in locomotive engines.

A specimen of lignite was also tested as to its calorific value, and was found to yield 5,737 calories, as against 8,000, the figure usually given by Natal coal.

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[*] See page 26 of my last annual report.

Other samples have also been examined from time to time, with a view to discovering coal; *e.g.*, an earthly graphite from Laingsburg, but nothing of promise has come to light.

(v) *Petroleum.*—Discoveries of mineral oil are still reported at times, without anything of a practical nature resulting. Allusion was made in my last Annual Report (p. 28) to the manner in which seekers after oil may be misled into the supposition that the genuine article has been struck. Not to refer to several further instances of this which have taken place during the year under report, a possible exception to the numerous false scents may be mentioned. Early in the year, from some slimy mud from a borehole near Zwartkops, in the Uitenhage Division, about 20 cubic centimetres of a mineral oil was extracted. The oil was dark red by transmitted and greenish by reflected light, and had a specific gravity of ·898. Whether it was naturally present in the mud, or had been subsequently added, there was no evidence to show, but a *prima facie* case seemed to have been established for further steps to ascertain the genuineness of the discovery, and to gauge its value.

(vi) *Platinum.*—Incidental reference was made in my last annual report to the alleged discoveries of Platinum in the Eastern Province. As far as the Government Laboratories were concerned, however, there had then been no confirmation of the belief that platinum existed in the localities stated. During the year further samples were submitted to analysis in the hope of finding platinum. In the Cape Town Laboratory a quartzite studded with iron pyrites was examined in this connection, and found to contain about a quarter of a grain of gold per ton, but no platinum. In another sample, tested with the same object, faint traces of gold were also found, but nothing more. A third rock—a carboniferous shale—yielded neither gold nor platinum.

In the Grahamstown Laboratory a series of similar tests have been made at various times throughout the year, but with no better results. The first to be assayed was a rock certified to be the same as that in which another gentleman had found 1·6 oz. of platinum, 1·2 oz. of gold, and 1·7 oz. of an alloy of platinum, osmium and iridium per ton of rock. No trace of either platinum or gold was found. In a second sample, declared to be similar to the above, a trace of gold was found, but no platinum. Another sample, also of declared similarity—a hard carbonaceous shale, with a little iron pyrites—was examined for gold and platinum, but yielded no trace of either. A metallic button, stated to have been obtained from six ounces of rock, and weighing 5·2024 grammes, contained neither platinum nor iridium, but consisted of 5·1608 grammes of silver, ·0385 of a gramme of gold, and ·0031 of a gramme of siliceous matter. If this button had really been obtained from only six ounces of rock, and that had been an average sample, the proportion of gold and silver present would be, respectively, 6 ozs. and 960 ozs. per ton. At a later date two lead buttons, obtained apparently by the crucible assay process, were analysed; no gold, platinum or iridium were found in either of these buttons. Two other samples of rock supposed to be platiniferous were analysed, but these, too, yielded no trace of platinum. In a dark carbonaceous shale, carrying iron pyrites, platinum was found in the proportion of 1 dwt. 10 grains per ton; connected evidence regarding the history of this sample was unfortunately unprocurable.

In no case had any sample examined for platinum been collected by any Government Analyst in person, nor was there a complete chain of evidence, with respect to any such sample, as to its representative nature or its origin. It was felt, therefore, that some vagueness existed about all the specimens examined. As the matter was creating considerable stir in some portions of the Colony, the Government appointed me a member of a Commission to proceed to the spot, and collect samples for analysis. At the close of the period covered by this report the analyses had not yet been performed; further remarks are therefore deferred for another occasion. Suffice it to say that the samples collected by the Commission were certified by a representative of those interested therein to have been fairly and properly taken; the results derived from their subsequent assay should therefore be regarded as thoroughly representative.

(vii) *Limestone.*—An excellent quality of limestone, one in every way suitable, that is to say, for the production of burnt lime, was found in the Riversdale Division, and its analysis resulted as follows:—

Silica and Gangue	1·00	per cent.
Oxide of Iron and Alumina	·36	„
Lime	55·40	„
Magnesia	2·38	„
Carbon Dioxide	40·63	„
Sulphuric Oxide	Traces.	

From the Mafeking District a limestone was received for the purpose of testing its adaptability for water softening. On analysis the following figures were obtained:—

Calcium Carbonate	82·45 per cent.
Magnesium Carbonate	·95 ,,
Oxide of Iron and Alumina	1·92 ,,
Silica and Gangue	13·20 ,,
Moisture (by Difference)	1·48 ,,

For the purpose required this article seemed to be capable of yielding a good product when burnt, due allowance being made for the silica contained. Great variations have been found to exist in the composition of local limestones, so that the purity of any particular deposit would need to be subjected to a constant check where it is intended to apply it to any purpose requiring a uniform grade of article. In the undeveloped state in which practically all these deposits are little more can be said regarding them at present.

(viii) *Various Analyses.*—Only one sample was assayed for *silver* during the year, but that metal was absent. An *alum*—whose composition, however, could not be determined, on account of the small quantity of the sample received—was found in a mineral from Mossel Bay. A yellow *diamond* (specific gravity 3·35), weighing nearly half a carat, was received from Matatiele. Quartz crystals were sent in from different localities, from Krakeel River, Uniondale, amongst others, under the impression that they were diamonds. Another article that is frequently submitted under erroneous impressions is a sand or *river deposit*, containing the minerals ilmenite and magnetite; at times the current idea is that it is tin that these deposits contain, at other times platinum is believed to be present. Such deposits are of common occurrence in various parts of the Colony, and hitherto have not been found to contain anything of commercial value. From the Oudtshoorn Division a specimen of *red iron oxide* deposit, resembling the type used by Kaffirs for painting their faces, was received: when found in a very pure state, such deposits may be used for making red paint, but this particular sample was of too earthy a nature. A somewhat similar gritty red clay was submitted from the Caledon Division. Amongst the other iron-containing minerals received may be mentioned some *limonite* from Mossel Bay, and a specimen of *specular iron ore* from Aberdeen. A shale from the Division of Herbert proved to contain *free sulphuric acid*, due, in all probability, to the decomposition of iron pyrites, a common phenomenon in this Colony, of which more than one instance has already come under notice. A specimen of calcspar, from the Calvinia Division, was found to be studded with prismatic metallic crystals of Arsenopyrite, or *Mispickel*, a mineral containing as much as 46 per cent. of arsenic. A sample of supposed asbestos, apparently from the Bushman's River, proved to be the mineral *Bushmanite*, a magnesium alum, which occurs in fibrous masses at Alum Kraans, on the river whence it derives its name. Dana describes it as Bosjemanite. A somewhat similar occurrence in Tembuland was mentioned on page 24 of my annual report for 1895.

V. MISCELLANEOUS ANALYSES.

(i) *Toxicological and Chemico-legal Analyses.*—The unsatisfactory condition of the scientific foundation, on which this branch of the Laboratories' work rests, still continues, but it would, I fear, be of small avail to reiterate the observations made on page 29 of my last annual report, and on page 39 of the report for the previous year. Tabulated below is a summary of the chemico-legal and toxicological cases dealt with during 1907:—

Date of Report.	Locality.	Race, sex and age of victim.	Suspected cause of death or illness.	Whether fatal or not.	Result of examination.
I. *Capetown Laboratory.*					
June 27	Swellendam	Dogs	Poisoned bread	—	Strychnine.
,, 27	Taungs	Nat. f. adult	Murder by violence	One death	Bloodstains present.
Aug. 3	Steytlerville	Eur. m. adult	Poisoned coffee, etc.	Not fatal	Arsenic.
,, 9	Beaufort West	Eur. infant	Arsenic	,,	Negative.
,, 28	Cape Town	Eur. children	Cyllin	,,	Indefinite.
,, 31	Britstown	Eur. family	Attempt to poison	,,	Strychnine.
Sept. 11	Tulbagh	Two calves	Arsenic	Fatal	Arsenic.
,, 14	——	Sheep	Sheep Dip	,,	,,
,, 21	Stellenbosch	Eur. m. child	Arsenic	,,	Negative.
Oct. 14	Prieska	Eur. m. adult	Irritant poison	,,	,,
,, 18	Britstown	Nat. m. adult	Unknown poison	,,	,,
,, 24	Port Nolloth	Eur. m. adult	Supposed suicide	,,	Arsenic.
Dec. 11	Stellenbosch	Eur. family	Poisoned porridge	Not fatal	Antimony.
,, 11	Kenhardt	Eur. f. adult	Unknown poison	Fatal	Indefinite.
,, 13	Victoria West	Eur. m. adult	Sheep Dip	,,	Arsenic
,, 16	Griquatown	Eur. family	Poisoned food	Not fatal	Negative.

Date of Report.	Locality.	Race, sex and age of victim.	Suspected cause of death or illness.	Whether fatal or not.	Result of examination.
II. *Grahamstown Laboratory.*					
Jan. 8	Sandflats ...	Eur. m. child	Patent Medicines ...	One death	Negative.
„ 23	Mqanduli ...	Kaf. f. adult...	Indigenous plants ...	„ ...	Poisonous resin.
March 22	East London ...	„ ...	Assault ...	Not fatal	Negative.
May 11	Middelburg ...	Three horses...	Arsenic or Strychnine	Two deaths	„
July 9	„ ...	Horse ...	Arsenic ...	One death	Arsenic.
„ 30	„ ...	„ ...	„ ...	„	Negative.
Aug. 8	Pearston ...	Eur. f. adult...	Assault ...	Not fatal	„
„ 27	Albany ...	Eur. m. adult	Hydrocyanic acid ...	One death	Potassium cyanide.
Sept. 9	Steynsburg ...	Sheep ...	Arsenical dip ...	„	Arsenic.
Oct. 7	Port Elizabeth ...	Eur. m. adult	Poisoned milk ...	Not fatal	Formaldehyde.
„ 28	Middelburg ...	Horse ...	Arsenic ...	One death	Arsenic.
„ 30	„ ...	„ ...	„ ...	„ ...	Indefinite.
Nov. 8	Grahamstown ...	Eur. f. child ...	Murder by violence ...	„ ...	Bloodstains.
Dec. 3	Steynsburg ...	Eur. family ...	Poisoned coffee ...	Not fatal	Arsenic
„ 30	Grahamstown ...	Eur. m. adult	Strychnine ...	One death	Strychnine.

The first of the cases tabulated above revealed a dangerous practice of destroying dogs by placing bread poisoned with strychnine about village streets. In one of the other cases mentioned a medical man had certified to alcoholic poisoning as the cause of death, but the analysis subsequently showed that a large quantity of white arsenic had been taken. This is the second occasion upon which the value of these chemical examinations has been demonstrated in this particular way. A few years ago a case occurred where much arsenic was found in the stomach of a person whose death the medical attendant had pronounced due to oxalic acid.

The Taungs case afforded a further opportunity for application of the precipitin test for blood.*

A native woman had been hacked to death, and a hat, jacket, trousers, shawl and axe in the possession of the supposed murderer were submitted for examination. The following important information was elicited by means of the tests now at our disposal: Bloodstains were found on all the articles except the shawl; of four on the jacket, three were human and one ox blood; of two on the trousers, one was ox blood and the other human, while two on the hat were both ox blood. The importance lay in the accused having ascribed the blood stains to his having been engaged in slaughtering an ox. The blood on the axe was too minute in amount to test more definitely.

In connection with the fatal poisoning case at Mqanduli various specimens of bulbs and roots were received for analysis, together with the stomach and intestines of the deceased woman. In the latter organs no trace of alkaloids or glucosides were detected, although a perceptible amount of resinous material was extracted, which will be referred to again. In the stomach were found vegetable particles closely resembling fragments of one of the bulbs submitted. One specimen of pieces of root and bulb,* tested for alkaloids and glucosides, gave negative results, but it contained a considerable amount of resin, 13 grains in 1¼ ounces of the material. This resin was, on further examination, found, by the reactions described below, to be identical with that obtained from the stomach. Another dried portion of a bulb, like the former, unnamed and unidentified, also contained the resinous body, already mentioned. A third specimen consisted of an entire bulb, fresh and just commencing to sprout; it was referred to as "Tyumtyumana," and declared to be identical with the dried specimen. It had a distinctly acid reaction towards litmus, and possessed a bitter and very nauseous taste; from ¼ of an ounce 7½ grains of a resinous body were extracted, but no alkaloids or glucosides. This resinous body was almost insoluble in cold water, and slightly soluble in ether, but dissolved more readily in chloroform, in alcohol, and in water which had been slightly acidulated. It was removed from acid solutions by immiscible solvents, dissolved in caustic alkalies with a darkening colour, and gave the following characteristic reactions:—

Concentrated sulphuric acid	Yellow, brick red, changing to dark brown.
Concentrated sulphuric acid with trace of Potassium bichromate.	Deep emerald green, changing to blue after one hour.
Concentrated nitric acid	Bright yellow to brown.
Ferric chloride (aqueous)	Light brown precipitate.
Copper acetate (aqueous)	Bluish white precipitate: on shaking with ether the latter is not coloured.
Copper acetate (alcoholic)	Greenish precipitate: supernatant liquid bluish.
Lead acetate (aqueous)	White precipitate.
Lead acetate (alcoholic)	White precipitate.

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* See p. 29 of my report for the year 1904 and p. 30 of that for 1905.

† Stated to be fragments of the very bulb partaken of by the deceased.

To a full-grown healthy cat a quantity of the fresh bulb, representing three grains of the resin, was administered, together with six grains previously extracted from one half of the same bulb. The animal soon appeared very uncomfortable, began frothing at the mouth, and died in less than an hour. A post-mortem examination showed the organs to be normal, except the stomach and heart, the former of which contained a frothy mucus, while the right ventricle of the heart was distended with blood.

To a vigorous rat nearly two grains of the resin in aqueous solution were administered. Speedily it became ill, appeared to be in pain, and died within 12 hours. Examination revealed very similar appearances to those observed in the case of the cat: the stomach and intestines, moreover, were much congested. To another healthy rat a very much smaller quantity of the fresh root, powdered and mixed with fifteen drops of water, was given. It also took ill shortly afterwards, and appeared to have spasms of severe pain, but after 24 hours began to recover.

It appeared from these experiments that the woman had died from the effects of taking the plant, which contained a soft, bitter resin, acid in character, possessing a peculiar odour, and marked toxic properties. Fifteen grains of this resin were found in one bulb, and there was no doubt that, if administered in large doses, it would prove fatal.

The repeated losses by Mr. Charles Southey of a number of valuable thoroughbred horses by mysterious and apparently malicious poisoning, extending over a period of several months, will be fresh in the recollection of many. The pecuniary damage amounted to some thousands of pounds, and the matter was subsequently taken up by the Government as of more than private interest, and the large number of analyses performed, of various animal organs, skin, hair, hides, and manure cannot in any way be grasped from the four or five lines in the above table. The detection of arsenic in several of the articles examined led to conviction and imprisonment of one offender for a term of years. It is interesting to note, in this connection, the preservative action of arsenic: in one of the cases a mare had been buried for ten months, but when exhumed the stomach and its contents were as fresh as though just placed underground. The contents of this stomach yielded 4·86 grains of arsenious oxide, equivalent to about 22 grains of Cooper's dip, the material used for destroying the mare.

The Port Elizabeth case illustrates the danger of adulterating milk with formaldehyde—an offence for which frequent prosecutions have taken place under the Food and Drugs Act. A resident in that town, after partaking of his milk in the morning, became violently ill, vomited, and was subsequently indisposed for some days. In the meanwhile the suspected milk was sent to the Grahamstown Laboratory for analysis, as well as some milk taken direct from the dairyman who supplied that particular sample. The first sample was found to contain 7½ parts of formaldehyde per 10.000 of milk, and the second 5½ parts per 10,000. The milk was already thirteen days old when received in the laboratory, and, as formaldehyde gradually disappears from milk preserved thereby, it is more than probable that a much larger quantity was present in the milk when partaken of. Experimental evidence shows that one tenth of a gramme is the maximum permissible dose of formaldehyde for a healthy child, aged 2½ years, and one fiftieth of a gramme the maximum for an infant of six months. Even assuming that no more formaldehyde was originally present in the milk than that detected by analysis, a pint of the two milks analysed contained about two fifths of a gramme and three tenths of a gramme respectively. The maximum dose would therefore be exceeded in the case of a child of 2½ years taking five ounces of the milk. Vomiting, followed by death in 29 hours, has taken place in the case of a youth who had taken 2½ grammes of formaldehyde, whilst Mr. Otto Hehner, F.I.C., the well-known London analyst, records having experienced violent abdominal pains, lasting for some days, after taking milk containing one part of formaldehyde in 12,500. There was no doubt, therefore, that the Port Elizabeth dairyman, in adulterating his milk with this antiseptic, had overdosed it; and it is to be hoped that the occurrence of the case now recorded will lead to the repression of this pernicious practice with a firmer hand than ever.

(ii) *Analyses of Boiler and Mineral Waters.*—The following is a table of the principal analyses of water, other than those for potable purposes, performed during the year under report. The figures, other than hardness, are stated in grains per gallon, hardness being calculated in parts per 100,000 .

Serial No.	Locality.	Source.	Total Solids at 100 C.	Silica.	Alumina & oxide of iron	Lime.	Magnesia.	Alkalies as NaO.	Chlorine.	Sulphuric oxide.	Carbon dioxide.	Hardness.	
												Temporary	Permanent.
1	Aberdeen Road	Borehole	175·2	2·04	·30	40·08	18·59	23·80	67·10	25·37	...	43·2	72·54
2	Bethesda Road	..	23·52	·86	·14	2·50	·22	7·08	2·24	3·26	...	8·0	nil
3	Blaney ...	..	24·20	1·96	·20	4·90	1·56	5·07	5·70	·75	...	17·0	1·2
4	Colesberg ...	,,	53·48	2·60	·24	11·40	6·35	...	7·14	4·22	...	24·27	28·58
5	Dwaal ...	..	29·68	2·54	·30	6·54	4·38	·69	1·82	1·41	...	27·60	4·57
6	East London ...	River	36·96	...	...	...	...	...	13·72	...	...	...	...
7	Fort Beaufort...	Spring	32·20	2·62	·30	1·06	·24	13·24	14·20	·93	...	4·2	nil
8	Fullarton ...	Borehole	207·20	2·06	·36	22·06	7·67	71·20	83·86	28·23	...	28·6	28·3
9	Great Berg River	River	8·60	1·98	·50	·32	·36	2·38	2·48	·30	...	·27	nil
10	Isinuka ...	Spring	2155·40	2·43	·70	39·22	15·40	1035·26	725·44	436·90	200·51	...	...
11	.. ...	,,	2318·60	2·12	·58	39·52	13·93	995·35	678·39	425·90	192·81	...	...
12	Nelspoort ...	Borehole	...	1·58	trace	3·88	1·84	...	...	2·61	...	...	...
13	Oudtshoorn (Welbedacht)	,,	240·8	2·52	·74	16·38	4·87	92·13	119·0	9·67	...	15·46	8·49
14	Steenbrazems River.	River	6·0	·4	·1	·1	·3	...	1·7	...	...	...	...
15	Steytlerville (Klipgat)	Well	270·20	2·02	·76	21·60	4·55	110·10	109·34	30·27	...	51·0	18·0
16	Wemmers Hoek	River	2·4	·3	·2	·1	·2	...	·7	...	...	...	...
17	Willowmore ...	Borehole	183·40	1·44	·18	13·00	13·83	61·00	61·43	29·72	...	46·45	13·90
18	Willowmore (Kraanspoort)	Pool	124·60	1·50	·38	12·68	11·69	37·45	42·49	10·04	...	57·0	1·5

The purest, chemically, of the waters in the above table, are those from Wemmer's Hoek and Steenbrazems River, the former being amongst the purest ever analysed in this laboratory. The Steenbrazems River water is also very pure when one considers mineral constituents only, but it contains a quantity of organic matter in solution: this seems to have an action upon stationary boilers which has not been reported with regard to locomotive engines. The damage has been caused, especially where superheated steam is used, apparently by electrolytic action induced by the presence of the organic substances mentioned. Some five years ago a very peculiar pitting action was noticed in the boiler tubes of stationary engines fed by water from the Molteno Reservoir, Cape Town. The well known mineral purity of the water precluded the cause being ascribed to the presence of dissolved mineral salts: it was, however, surmised that possibly the contingent circumstances operating in connection with the particular boiler were influenced by the organic matter in the water, and expression was given to this view in connection with a subsequent case to which reference was made on page 32 of my last annual report.

The two Isinuka waters were collected at the springs referred to in my report for the half-year ended 30th June, 1904, p. 39. It is understood that the water bubbles to the surface from many openings, emitting meanwhile large volumes of sulphuretted hydrogen gas. The temperature of the spring is said to be 67° Fah. The second of the two samples was from a spring which comes out in the bed of a small fresh water stream about 100 yards distant from where the first sample was taken. As indicated on the former occasion, accurate analysis of a water of this character cannot be satisfactorily performed at a spot nearly 1,000 miles distant from the point of collection.

The Fort Beaufort spring above mentioned is close to that town, and in past years, it is said, enjoyed a considerable reputation for its curative properties in chronic ailments, rheumatism particularly. In addition to the figures in the table other determinations were made, from which the following composition of the salts in one gallon of the water may be approximated.

	grains.
Calcium carbonate	1·890
Magnesium carbonate	·495
Sodium carbonate	·487
Sodium sulphate	1·647
Sodium bromide	trace.
Sodium chloride	23·107
Potassium chloride	·327
Silica	2·620
Oxide of Iron and Alumina	·300
Sulphuretted Hydrogen	·787

A trace of Lithium was also found in this water.

(iii) *Analyses of Red and White Lead.* Early in the year an order (No. 916) of the Australian Commonwealth was issued, wherein it was stated that a recent importation into that country of white lead was described on kegs as "ground white lead, reduced." It was announced that the term "reduced" did not in that case sufficiently denote "adulteration" for the purposes of the Commerce Act. It was therefore laid down that in future the percentage of Barium, or any other adulterant in white lead, must be as clearly and as permanently shown on the coverings of the goods as the ordinary trade description applied thereto, and that delivery would not be permitted until this condition was fulfilled.

Analyses performed during the year have shown that in this Colony too there would appear to be a need of some such restrictive measure. A sample of "ground white lead" imported from Europe was found to contain only 29 per cent. of true white lead ($2\ PbCO_3 + PbO_2H_2$) the remainder consisting chiefly of Barium Sulphate. This Barium Sulphate is a common adulterant of white lead. Some months later a red lead (Unicorn Brand) was imported into the Colony, and upon analysis proved to contain only 15 per cent. of red lead; the remainder was chiefly crude Barium Sulphate coloured by means of a red organic dye.

(iv) *Various Analyses.*—Many *patent medicines* and other articles have from time to time been tested for revenue purposes in connection with the proportions of alcohol contained. Some specimens of *varnish* proved to be little more than mere shellac dissolved in methylated spirit: they had not sufficient body to be truly termed varnishes, and the spirit used in their manufacture had not been efficiently denatured.* The consequence of this is that the spirit could be easily recovered from the so-called varnish by the simple process of distillation, and, on account of the loose method of denaturing, it would not then be of a sufficiently nauseating character to prevent its being used as an intoxicating drink. More than fifty *lubricating oils* of various kinds have been examined with a view to testing their suitability for the object intended: most of these related to the railway service of the Colony.

Sixty-three samples of *ink*, including blue-black, copying and writing, red copying, carmine and opal inks, and also writing, copying and red ink powders were examined for the requirements of the Government Stationery Office, and of these samples thirteen were placed in the first order of merit.

VI. GENERAL OBSERVATIONS.

(i) *Recent and Suggested Legislation.*—A considerable amount of work and thought was involved in the introduction during last session of Parliament of the "Fertilisers, Farm Foods, Seeds, and Pest Remedies Bill," which subsequently passed into law as Act No. 20 of 1907, and of the "Agricultural Products Bill," which had not yet passed all stages when Parliament was dissolved; also, to a smaller extent, in connection with the Mineral Law Amendment Act (No. 16 of 1907) of last Session. The "Bill to regulate and control the sale of gas for illuminating and heating purposes," to which reference was made on page 36 of my last report, has not yet been introduced into Parliament.

The reference made on a previous page to the adulteration of red and white lead, indicates another direction in which the protective capabilities of existing statutes seem to need strengthening. Conjointly with this the whole subject of the adulteration of commercial products other than foods may be taken into consideration. The subject of the adulteration of leather, for instance, has been brought to my attention during the year under report; as the law at present stands, the necessity exists—when legal proceedings are taken—of proving or disproving many assertions, and it is often exceedingly difficult to carry a point, hotly contested as it is certain to be. The specific declarations of a precise law, with its clear definitions, would of course obviate all this. In the meanwhile, it may be said that in India it is the practice to plaster the flesh side of the hides of small cattle (Kips) with a mixture of lime and water so as to weight them under the guise of preserving them. In Germany, sulphate of soda is substituted for common salt in curing the skins, because sulphate of soda retains more moisture, and so adds weight. These instances illustrate how difficult it is to prove fraudulent intention, unless we first have specific legislation. In order to be in a better position to deal with the importation of "faked leather" into this Colony, I suggested that statutes dealing with this subject should be procured from England and Australia. It was ascertained that the Pure Food Act of 1905 of Victoria forbids the use, as articles of human clothing, of hides or skins loaded with barium compounds, or with any other substance prohibited by regulation, and for sole leather a greater quantity than three per cent. of fats and oils taken together, and two per cent. of glucose and sugar taken together constitute adulteration. The provisions of the Federal Commerce Act provide that all loaded leathers exported from Australia shall bear, prominently attached, a label showing what loading substances are added, and in what proportions, while, if the above mentioned quantities of sugars and fats are exceeded, the fact shall be marked on the goods.

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* See remarks regarding denaturing of spirits on pages 34 and 35 of my last annual report.

(ii) *New Investigations.*—Ere concluding, mention should be made of several lines of chemical investigation along which at present little or nothing is being done: it will suffice to give the mere heads of these:—

1. Investigations regarding soils.
    (*a*) Plant food in soils.
    (*b*) Mechanical analyses and mapping of soil areas.
    (*c*) Brack or alkaline soils.
2. Control of sale of fertilisers, cattle foods, and insecticides.
3. Investigation of the composition of agricultural products grown on poor soils; *e.g.*, oathay as alleged cause of bone disease in cattle.
4. Investigations regarding animal diseases, *e.g.*, composition of bones of animals affected with lamziekte.
5. Investigation of composition of typical Cape wines and spirits.
6. Similar investigation with regard to Colonial jams and vinegars.
7. The composition of salt in various salt pans in the country.
8. Composition of typical waters and mineral springs in the Colony.
9. Investigation of indigenous medicinal and poisonous plants.
10. Various incidental circumstances, which have never been followed up for want of leisure: *e.g.*, several cattle were killed near Vryburg during the rinderpest epizootic and buried there, and on digging up a year later the flesh was found to be preserved as though by saltpetre. The cause of this has never been traced, and may be due to nitrates; it would be well if, in such cases, an analyst could be detached at a few weeks', or at most, a couple of months' notice, and despatched to the spot for special investigation.

(iii) *Concluding Remarks.*—It is impossible, in a report of this nature, to include all the work of the laboratories. Much of it consists of examinations, not needing actual analysis, and of consultations. As observed on former occasions, mere lists and tables cannot afford a full insight into the volume of work that has to be gone through.

Outside of what may be called the practical chemical work of the institution are the reports on theoretical or abstract questions that are called for occasionally. The following are the heads of some of these reports during the past year: "A Specification for Soap Manufacture," "Improvements Relating to Fuel," "Adulteration of Leather," "Deterioration of Lime and Sulphur Dip," "Use of Paraffin Tins for Preserved Fruit," "The Mineral Law Amendment Bill," "Occurrence of Limestone in the St. Mark's District," "The Dagga Plant," "The use of Sulphur for Vines and Sheep Dips," "Reported Occurrence of Platinum in the Albany Division," Comparative Analyses of Cape and Imported Meat," and "Determination of Lard Stearin in Lard."

Practically a month of my time the whole of December was spent detached from my usual duties, as a member of the Commission appointed to investigate the reported discovery of Platinum in the Bathurst Division.

In conclusion, I would remark that, owing to necessity for reducing expenditure, many tables and other matter usually forming part of my reports, have on this occasion had to be excised.

CHAS. F. JURITZ, M.A., D.Sc., F.I.C.
Senior Analyst.

APPENDIX XIII.

REPORT OF THE SUPERINTENDENT OF THE GOVERNMENT GUANO ISLANDS FOR THE YEAR 1907,

In consequence of the retirement of Captain Spence from the management of the Government Guano Islands, the duty of furnishing the Report on the working of these Islands for the year 1907 has devolved upon me, and being intimately acquainted with all the transactions of the Guano Department throughout the year, I have the honour to submit, for the information of the Government and the Legislature of this Colony, the following statement:—

During the season 1907 the Colonial Islands produced 2,428½ tons, and the Ichaboe Group 2,810 tons of Guano, making a total of 5,238½ tons approximately.

The total quantity of Guano shipped from the Islands during the year, and landed in Cape Town, was 4,664 tons, of which 1,092½ tons were supplied to the various depots throughout the Colony.

The sales throughout the year have shown a slight increase over those of the previous year— the total quantity of Guano disposed of being 5,585¼ tons, of which 3,684¼ tons were sold locally, and 1,901 tons through the medium of the depots The sum realised by sale of Guano was £33,872 1s. 6d.

No further shipments of Guano have been made to Europe.

The revenue derived from the sale of Penguin eggs during the season 1907 was £2,055 4s. 0d.

The Seal Skins secured during the winter and summer seasons of 1906-07, referred to in last year's report, have all been sold, but the prices obtained were not at all satisfactory. The net amount realised by these sales was £6,670 9s. 9d.

A small amount of revenue has also been secured by the sale of Seal Oil, viz.:—£158 5s. 9d. This oil was all sold locally, but owing to the little demand for this product, it had to be disposed of at prices very much below its value.

The Government sealing industry on the coast has suffered very severely owing to the systematic poaching by German subjects and others on the northern islands, and the operations of private sealers in Colonial waters, and reports received from the various islands, etc., upon which this pursuit has hitherto been carried on, have been most discouraging.

With regard to the Colonial sealing islands and rocks, most of these have been thrown open to private sealing enterprise, with the result that, owing to the energies of the persons engaging in this pursuit, the number of seals in the Colonial waters have diminished to such an extent that these animals have almost entirely disappeared from some of these islands, etc., as well as from the protected ones.

A similar state of affairs appears to exist on the northern islands. In some instances islands formerly bristling with seals are now reported to be entirely deserted.

Sealing operations were undertaken throughout the winter and summer seasons respectively this year on the Ichaboe group, as well as on the Colonial islands not thrown open to the public, but the results achieved have fallen very far short of those of previous years.

The total number of skins secured during the winter season from the Ichaboe group was 311, and from the Colonial islands 1,621, and during the summer season, from the former 1,668, and the latter 280, making a total of 3,880 skins for the year, as against 8,364 secured last year.

The skins taken during the winter season have been shipped to London and sold, but the result of sales had not, up to the date covered by this Report, yet come to hand.

From these facts and figures it will be seen that the anticipations of the Acting Superintendent, in his reports for the years 1905 and 1906, were well founded, and have been fully borne out, and that considerable revenue has been lost, as predicted.

Happily, by the issue of Proclamation No. 331 of 1906, and the subsequent Government Notice No. 464 of 1907, private sealing has been restricted to islands and rocks from which seals only are obtained—the Guano producing islands being protected as before, which has confined the loss of revenue to our sealing industry only. Had this not been done, there is not the least doubt but that the predicted disturbance and scaring of the birds on the protected islands and consequent loss of Guano, would also have been an accomplished fact.

In accordance with the recommendation of the Guano Islands Commission, the prices charged for licences issued to private sealers have been raised to £5 and £25 each, according to the size of the boats employed, and a small Royalty of 1s. per skin has also been imposed upon all seals taken, by holders of these licences, in the prescribed areas.

Only nine licences have been applied for and issued during the year, and the number of skins taken under these was 1,960, and from this source a small revenue of £143 has accrued.

The labours of the Guano Islands Commission were brought to a close during the early part of this year, and the recommendations made in their report have, so far as practicable, been given effect to.

With the view to giving farmers a more uniform quality of article, the sale of Rock Guano has been discontinued, and all collections are now being systematically mixed and sold at £6 per ton.

Owing to the depressed state of the Colony's finances, and the recommendation of the Budget Committee, during the last Session of Parliament, no provision was allowed on the Estimates for the payment of railway carriage of Guano, and this concession has therefore been withdrawn since the 24th September last.

All depots at railway stations, with the exception of that at Caledon, where there is still a small quantity of Guano unsold, have been closed during the year.

The depots at Knysna, Lambert's Bay, Port Elizabeth, and East London are still being continued, but none of these have been a success—the two latter being very expensive.

A depot has been opened at Storm's River, since September last, where a small stock of Guano is being kept to meet the requirements of farmers residing in that district.

The subjoined return gives the yield of Guano and Eggs from the islands administered by the Cape Government, for the calendar year 1907:—

Total Tons of Guano.	Malagas.	Jutten.	Lamberts Bay.	Dyers.	Marcus.	Dassen.	Foundlings.	Bird.	Paternoster.	Elephant Rock.	Ichaboe.	Possession.	Mercury.	Sinclairs.	Plumpudding.	Pomona.	Hollamsbird.	Halifax.	Total. Tons.
Collected ...	908	457¼	309¾	166¾	153½	142¾	128¾	111	38¾	12	1800	550	130	80	60	40	50	100	5238½
Shipped to Cape Town	858	457¼	298¾	166¾	153½	142¾	128¾	111	38¾	12	1638¾	347¾	130	80	60	40	...	...	4664

Of the above totals, 2,428½ tons were collected at, and 2,367½ tons shipped from, the Colonial islands, and 2,810 tons and 2,296½ tons, respectively, collected and shipped from the Ichaboe Group. Quantities shown as collected are roughly approximate, but shipments to Cape Town are actual quantities.

A total of 647,550 Penguin Eggs were gathered, viz.:—95,580 from Jutten Island, 27,000 from Dyer's Island, 9,540 from Marcus, 457,740 from Dassen, and 57,690 from Foundlings Island.

The quantity of Guano remaining on the Ichaboe Islands on the 31st December, 1907, was approximately 2,032 tons, and on the Colonial group 50 tons on Malagas Island, and a small balance left at Lambert's Bay for sale locally.

The following is a statement of the quantities of Guano distributed direct to the several divisions of the Colony and the other South African Colonies. These quantities were supplied and are expressed in bags. The total represents 3,684 tons.

Cape.	Stellenbosch.	Paarl.	Malmesbury.	Piquetberg.	Caledon.	Tulbagh.	Worcester.	Ceres.	Swellendam.	Robertson.	Humansdorp.	Prince Albert.	Graaff-Reinet.	Griqualand West.	Riversdale.	Alexandria.	Kimberley.	Griqualand East.	King Williamst'n	Queenstown.	Tembuland.	Victoria East.	Transkei.	Transvaal	O. R. Colony.	Rhodesia.	B. East Africa.	Total. Bags.
8978	7595½	6562	5261	1965	1884	1673	1519	640	366	170	80	20	14	11	10	10	6	6	2	2	2	2	1	39	3	11	10	36,842½

There were in addition to the above direct distribution, supplies to and sales of Guano at the following depots, as under:—

Guano at Depôts.	Paarl.	Worcester.	Malmesbury.	Caledon.	East London.	Port Elizabeth.	Lamberts Bay	Knysna.	Storms River.	Total Bags.
In Stock on 1.1.07	2577	1451	1233	2804	725	494	192	63	...	9,539
Supplied to	2875	1	6750	...	...	1000	108	150	150	11,034
Sold at	5447	1452	7981	2356	579	825	139	189	41	19,009

The seasonal variation in the year's distribution of Guano is as follows: —

Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total Bags.
1282½	2723¾	13356¼	16519	8662	3734½	2352	2317	1545	1283	1076½	1000½	55,851¼

Seals Killed.—The following is a return of Seal Skins obtained during the year 1907: —

Season.	Dyers Island.	Elephant Rock.	Total.	Sinclairs.	Steeples.	Long Island.	Hollamsbird.	Dumfudgeon.	Total.	Grand Total.
Winter	1001	620	1621	107	134	70	Nil.	Nil.	311	1932
Summer	Nil.	280	280	673	103	780	61	51	1668	1948

W. R. ZEEDERBERG,
Superintendent, Government Guano Islands.

GUANO ISLANDS.

Statement of Expenditure and Receipts from 1st January, 1907, to 31st December, 1907:

1907		£	s.	d.		£	s.	d.
January	To Expenditure	1,339	2	6	By Receipts	3,884	11	9
February	„ „	1,479	1	1	„ „	1,157	1	3
March	„ „	2,822	18	5	„ „	5,142	9	3
April	„ „	4,052	9	3	„ „	11,503	10	7
May	„ „	4,090	14	10	„ „	7,310	16	0
June	„ „	2,137	14	0	„ „	5,814	12	3
July	„ „	1,328	3	1	„ „	3,230	6	0
August	„ „	305	9	3	„ „	1,869	11	5
September	„ „	745	0	5	„ „	1,137	8	9
October	„ „	3,321	15	1	„ „	807	13	9
November	„ „	1,524	19	2	„ „	675	14	0
December	„ „	586	17	2	„ „	571	18	6
	„ Balance	19,371	9	3			...	
		43,105	13	6		43,105	13	6

G. W. CAFFYN,
Accounting Officer.

APPENDIX XIV.

REPORT OF THE EDITOR OF THE AGRICULTURAL JOURNAL FOR THE YEAR 1907.

REPORT OF THE EDITOR OF THE "AGRICULTURAL JOURNAL," FOR THE YEAR 1907.

The new departure in the system of distributing the *Agricultural Journal*, inaugurated at the beginning of the year, has resulted in a much wider circulation than the publication has ever previously enjoyed. And the circulation is increasing with each issue. The fact that it is now obtainable gratis by any *bona fide* farmer in the Colony, on application through the Resident Magistrate of the District in which the farmer resides, is not even yet so generally known as it should be, considering the wide publication of the announcement. The English issue has now reached a circulation of upwards of 7,000 and the Dutch issue is advancing towards 5,500 copies per mensem, notwithstanding the most careful scrutiny of all applications received.

These figures are very gratifying, but they mean greater expense for printing, etc. As the depression threatens to re-act upon the revenue derived from advertising, there is every indication that it may be necessary to increase the Vote should the number of new applications for gratis issues be continued. It will be impossible to maintain the present standard of the publication, and at the same time indefinitely expand the gratis issue, with a decreasing revenue.

It is to be regretted that it was found necessary, when the new system of distribution was introduced, to strike off the free list all non-farming members of Agricultural Societies and Farmers' Associations, to whom, previously, this privilege was extended. This question might be again considered if provision can be made for the extra cost, as I am given to understand that the privilege was very highly appreciated, and was a great help to the Societies mentioned in enabling them to increase the value of their work. The number of names thus struck off amounted to about 1,000, nearly all from the English List.

F. D. MACDERMOTT,
Editor, *Agricultural Journal*.

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